Nomination for Inclusion in the World Heritage List

Roșia Montană
Mining Landscape

Nomination Document

Photoplan showing the boundary of the nominated property and the buffer zone. ←

3. View of Tăul Mare, Roșia Montană (© Radu Sălcudean)

2. Description

2 a Description of Property

Roșia Montană Mining Landscape is a single area that comprises the gold mining landscape of Roșia Montană together with its historic underground mine networks.
The property is nominated as a cultural landscape.

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2.a A Location and setting

Roșia Montană is situated in a natural amphitheatre of massifs and radiating valleys in the Metalliferous range of the Apuseni Mountains, located in the historical region of Transylvania in the central part of Romania. The site represents the centre of the so-called Golden Quadrilateral of the Romania's Western Carpathians – the richest precious metals province in Europe.

2.a B Attributes

CODE	CATEGORY	NAME
1	**Mining Exploitation: Underground and Surface**	
1.1	Mining Exploitation: Underground	
1.1.1		Cârnic Massif Roman Galleries
1.1.2		Lety Massif Roman Galleries: Cătălina Monulești Roman Galleries
1.1.3		Cetate Massif Roman mining features

1.1.4		Orlea Roman Galleries
1.1.5		Cârnic Roman fire-setting complex
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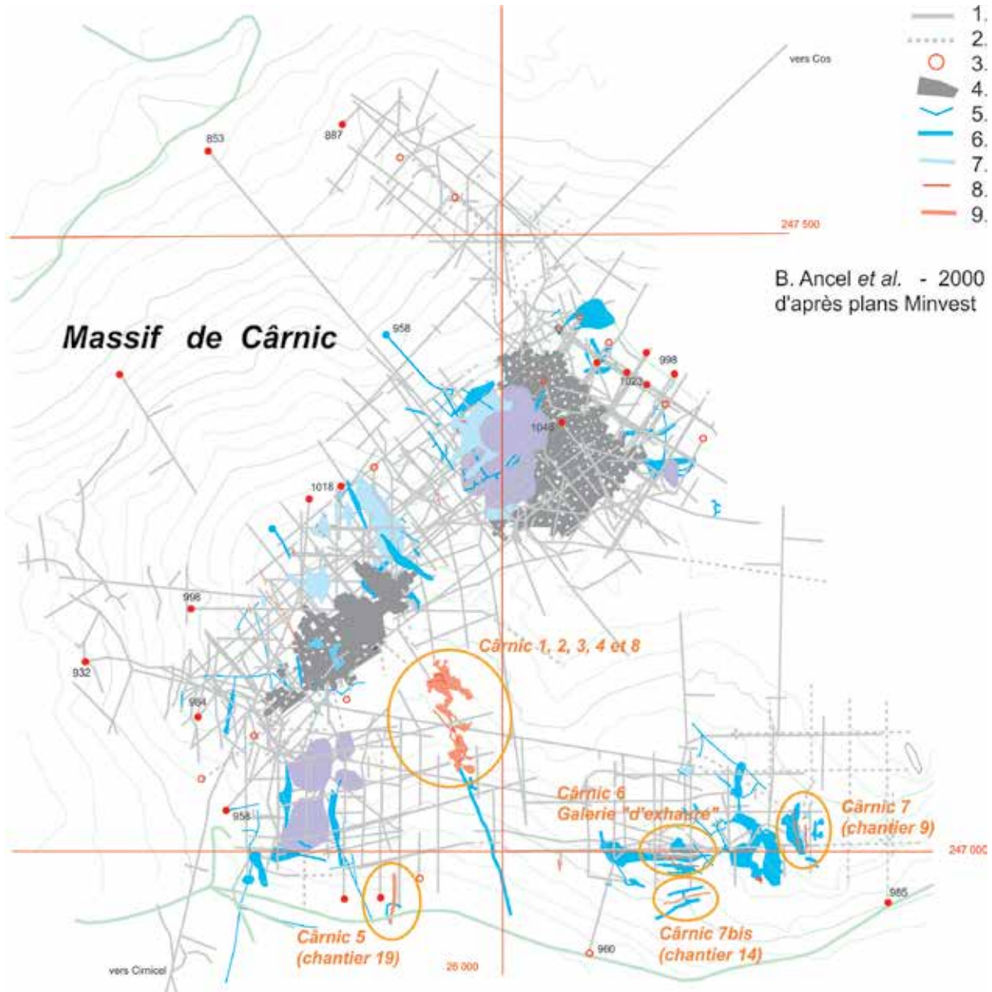
1.3.2		Tăul Țarina
1.3.3		Tăul Corna
1.3.4		Tăul Brazi
1.3.5		Tăul Anghel
1.3.6		Tăul Cartuș
1.3.7		Tăul Țapului
1.3.8		Tăul Găuri
1.3.9		Ore Rail
1.4	Mining administration	
1.4.1		State Mining Headquarters (18th – 20th centuries)
1.4.2		Miners' Dormitory (early 20th century)
1.4.3		Mining Professional School (late 19th century)
2	**Archaeological Areas**	
2.1	Roman archaeology	
2.1.1		Hăbad Sacred Area
2.1.2		Găuri – habitation
2.1.3		Hăbad – habitation
2.1.4		Tăul Țapului
2.1.5		Hop Necropolis
2.1.6		Nanului Valley Sacred Space
2.1.7		Carpeni Zone
2.1.8		Jig-Piciorag Area
2.1.9		Țarina Necropolis
2.1.10		Pârâul Porcului - Tăul Secuilor
2.1.11		Tăul Cornei - Corna Sat Zone
2.1.12		Balmoșești - Islaz Area
3	**Built Heritage Features**	
3.1	Modern town / Village	Roșia Montană (Modern)
3.1.1	neighbourhood in the upper zone	Square
3.1.1.a	cluster	Townhouses with commercial ground floors; no. 323-328, 388 (late 18th – early 19th century)
3.1.1.b	cluster	"Sicilian Street"
3.1.1.c	cluster	Roman-Catholic Church and parish ensemble (18th - middle 19th, early 20th century)
3.1.1.d	cluster	Unitarian Church and parish ensemble (1796, 18th - middle 19th cent, 1933)
3.1.1.e	cluster	The Casino (1880-1900), no. 329, and Summer Garden
3.1.1.f	cluster	The former Administrative Palace (1896), no. 310
3.1.2	neighbourhood in the upper zone	Brazi
3.1.3	neighbourhood in the upper zone	Ieruga
3.1.4	neighbourhood in the upper zone	Tăul Brazi
3.1.5	neighbourhood in the upper zone	Văidoaia
3.1.6	neighbourhood in the upper zone	Berk
3.1.7	neighbourhood in the upper zone	Sosași
3.1.8	neighbourhood in the upper zone	Orlea
3.1.8.a	cluster	Greek-Catholic Church and parish ensemble (1720, 1741, mid 19th century), no. 135
3.1.8.b	cluster	Orthodox Church and parish ensemble (1781, mid 19th century), no. 175
3.1.8.c	cluster	The administrative centre. Town Hall
3.1.9	neighbourhood in the lower zone	Gura Minei
3.1.10	neighbourhood in the lower zone	Vercheș
3.1.10.a	cluster	Aitaj House, later Miners' Club (no. 242), Maternity ward (no. 251), Gritta House (no. 258), Miner households
3.1.10.b	cluster	State school and kindergarten; no. 274 (1905-1915)
3.1.10.c		Blocks of flats of the 1960s
3.2	Town / Village	Corna (Modern)
3.2.1		Orthodox Church (1719), no. 707
3.2.2		Greek-Catholic Church (19th century), no. 692

3.2.3		Miners households
3.3	Town / Village	Țarina (Modern)
3.3.1		Traditional farmhouse (19th century), Țarina no. 1248
3.3.2		Traditional farmhouse (20th century), with polygonal stable, Țarina no. 1254
3.4	Town / Village	Balmoșești, Blidești (Modern)

1 Mining exploitation: Underground and Surface

1.1 Mining exploitation: Underground



4. Underground mining networks in Cârnic (MNIR Archive).
1. Recent works, 2. Unaccesible works, 3. Mine entrance, 4. Recent pillar room, 5. Modern gallery, 6. Vertical Modern site, 7. Horizontal Modern site, 8. Roman gallery, 9. Roman site.

70 km of underground works have so far been surveyed during recent investigation (out of 150 km estimated), with archaeologists assigning a time bracket in the following approximate proportions:

→ 7 km (10%) "Ancient" workings excavated by hand with iron tools and/or fire;

→ 10 km (14%) "Modern" workings (17th and 18th centuries) excavated by blasting with black powder;

→ 53 km (76%) "Recent" works (19th and 20th centuries) excavated by dynamite and modern powered equipment.

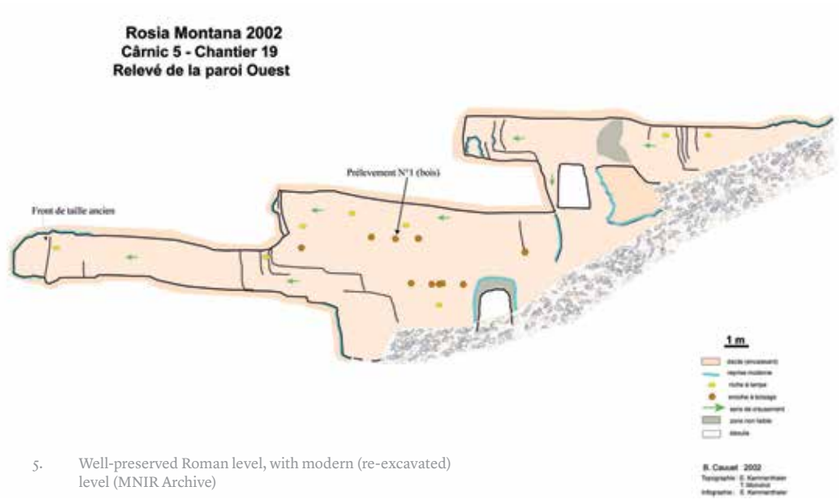
The Roman workings recorded are not a single network but a total identified across all the targeted massifs (with greatest emphasis placed on the investigation of the Cârnic and Cetate Massifs). All such workings were encountered in a condition described as back-filled, a common mining practice that indeed has aided the structural preservation of certain features and artefacts. Such backfill, however, was commonly not "ancient", most ancient workings having been reopened by subsequent generations of miners during the medieval and modern periods ('Roman' miners were heavily selective of the highest-grade ores, leaving a resource of profitable values exposed and in situ for later miners). Most Roman workings are therefore commonly intersected by later workings, inevitably leading to a loss of integrity. What survives – and indeed what is recorded so far – still means that Roșia Montană represents the most extensive and technically diverse underground Roman gold mining complex currently known in the world.

Based on a meticulous inter-disciplinary approach, and some modern technology – including 3D scanning – the broad layout of the Roman mining works could be reconstructed. This revealed a systematic consistency in shape and distribution of uniform, highly engineered, workings – all likely made within the space of a little over 60 years.

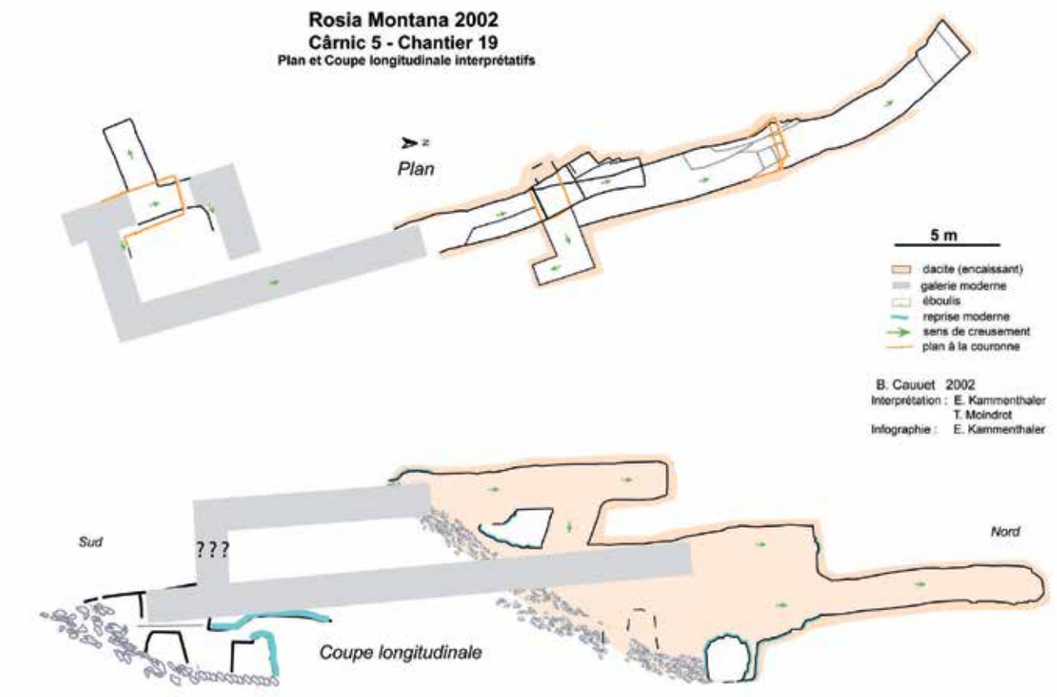
→ 1.1.1 Cârnic Massif Roman Galleries

This is the most extensive and significant mining system recorded anywhere in the Roman Empire. The Roman galleries in Cârnic contain three major technical typologies of mining that are unparalleled elsewhere, including within other Roman networks in Roșia Montană: spiral staircase galleries; vertical stopes with roofs cut in reverse stairs; and pillar-supported stopes. A fourth typology, seen in other Roman mines, inside and outside of Romania, are stepped communication galleries.

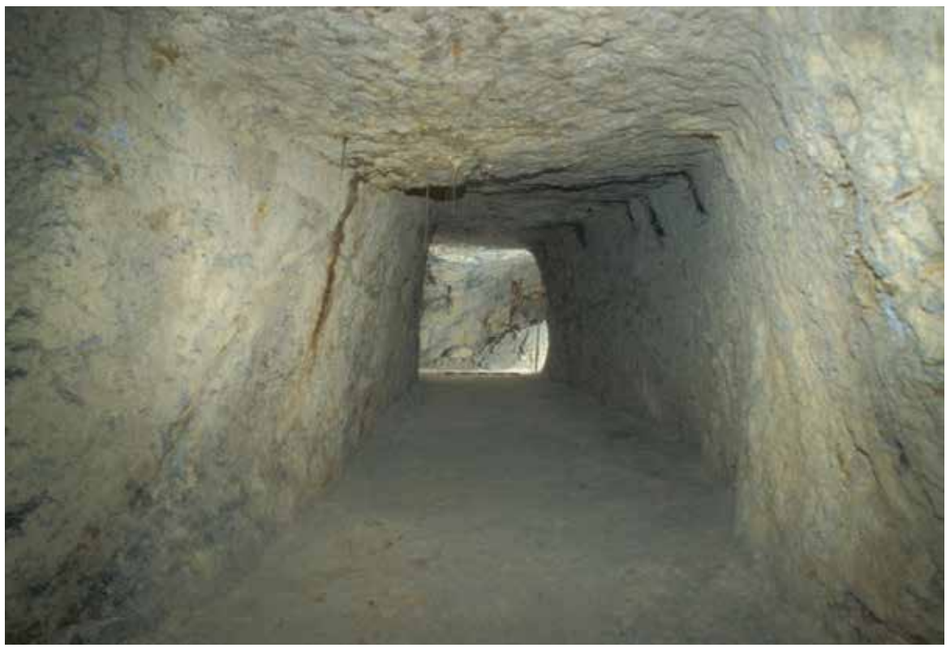
A precious discovery was that of a Roman hydraulic system in the Păru Carpeni mine, a very significant property in the ensemble. This was the first such example to be found and properly recorded in Romania by archaeologists. In a relatively good state of conservation, it is a rare discovery in the Roman world and its remains have been recorded and left in a state of preservation in the humid levels of the mine.



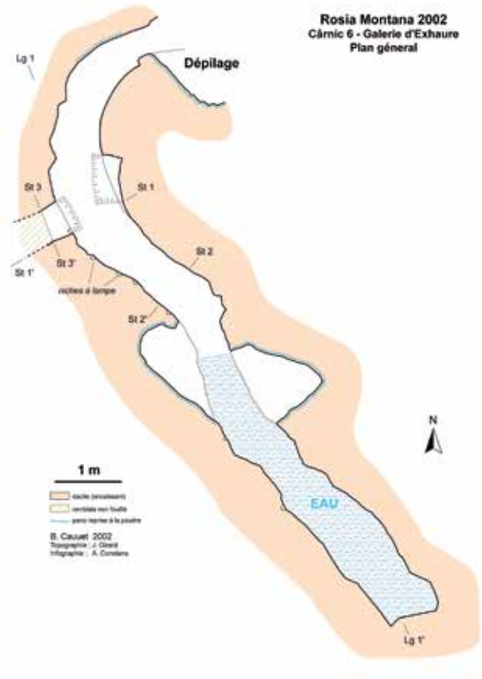
5. Well-preserved Roman level, with modern (re-excavated) level (MNIR Archive)



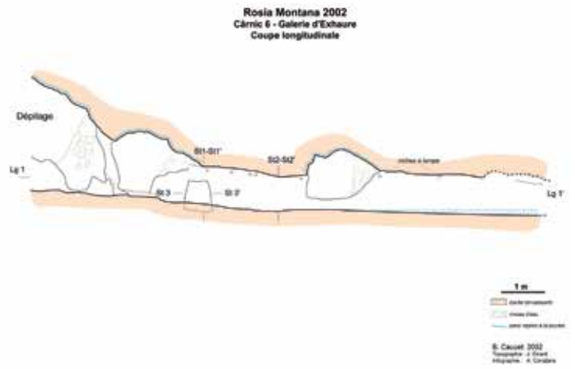
6. Roman level crossed by modern level (MNIR Archive)

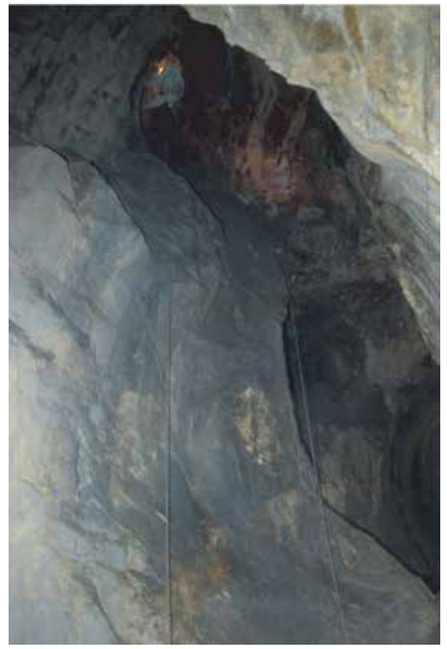


7. Blackened wall markings indicating positions of lamp niches (MNIR Archive)



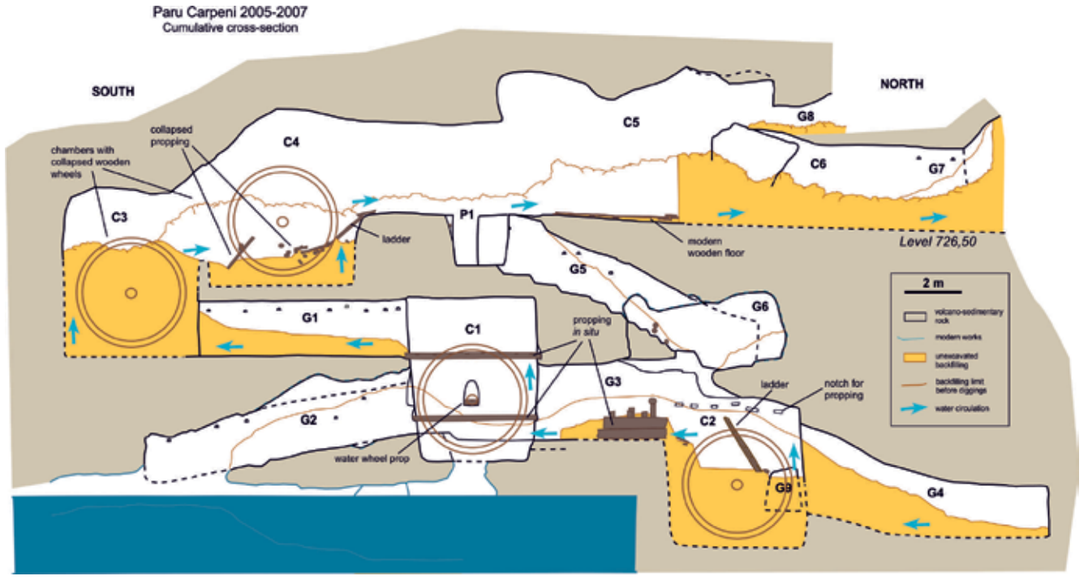
8. Roman adit level (MNIR Archive)





9. Roman galleries with evidence for fire-setting (MNIR Archive)

10. Roman galleries intersected by modern workings (MNIR Archive)



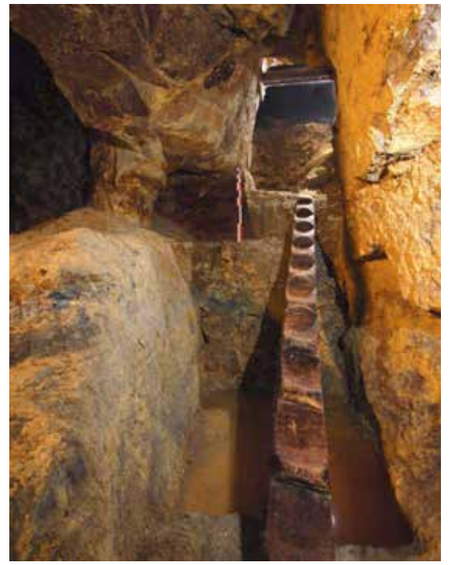
11. Păru Carpeni: Cumulative cross-section of the two levels with four water wheel chambers for drainage (© Beatrice Cauuet)

12. Păru Carpeni: Water wheel chamber with monoxyle ladder - as discovered in situ. (© Beatrice Cauuet)

→ 1.1.2 Lety Massif Roman Galleries: Cătălina Monulești Roman Galleries

This network includes the galleries of Cătălina Monulești, Sf. Iosif and Sf. Laurențiu, and contains much pristine archaeology, including dated Roman woodwork in various contexts. The specific conditions of humidity are ideal for preservation and many artefacts discovered have been recorded and left in situ.

A remarkable treadmill-powered water-dipping wheel system was discovered in Cătălina Monulești during archaeological investigations in the 2000s, installed in multiple chambers, one upon the other, it represents the same design as that discovered in Păru Carpeni mine in Cârnic Roman Galleries.



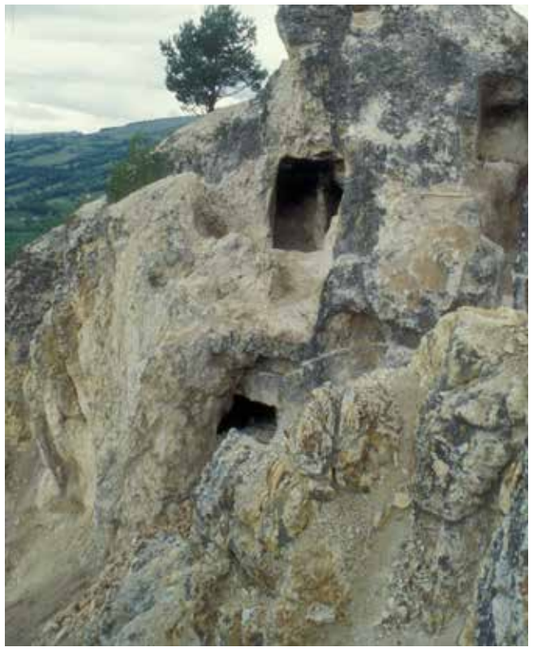
13. A monoxyle notched ladder (4.90 m length) discovered in a perfect state of preservation inside the backfill of a vertical, stepped, stope in Cătălina Monulești Mine. Well-organised transport routes for miners include stone-cut stairways and ramps, and larger steps climbed with wooden ladders that suggest that ore and waste rock was removed from underground carrying loads on their backs. (© Beatrice Cauuet)

14. Launder (wooden water-channel) that received water from the still adjacent remains of the upper waterwheel in Cătălina Monulești Mine. (© Călin Tămaș)

15. Waterwheel hub – still in connection with its spokes – discovered in Cătălina Monulești Mine. Two complex treadmill-powered water-dipping wheel systems (Cătălina Monulești, and Păru Carpeni mines) were found installed in multiple chambers, one upon the other, and which eventually discharged via a short adit. (© Călin Tămaș)

→ 1.1.3 Cetate Massif Roman mining features

Cetate Massif has been subject to archaeological excavations (Zeus Area, Găuri Area), but most of the Roman mining features have not been yet addressed. An important part of the Cetate Massif has been compromised in terms of integrity by the incursion of modern workings. Still, under the modern exploitation level there is an area of great potential, poorly or never researched to date.



16. Cetate-Zeus Area. Roman works (MNIR Archive)

→ 1.1.4 Orlea Roman Galleries

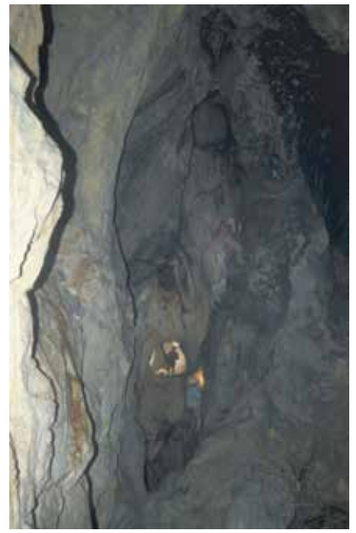
Orlea Massif has only been subject to preliminary archaeological investigation – both underground and at surface where it is thought that there are likely concealed Roman entrances to mine workings. A wooden notched ladder was found in the Roman galleries and radiocarbon dated to the 2nd century CE.

The quality of Roman mining engineering is apparent in the perfectly carved trapezoidal-section galleries and stepped inclined shafts of the Orlea Galleries, open to visitors since the communist period in the 1970s when the mining museum was first established. Some authenticity has been partially impacted in the provision of access, but this is partly reversible, as is some rather obtrusive cabling infrastructure.

17. Roman galleries with trapezoidal cross-section (© Lorin Niculae)

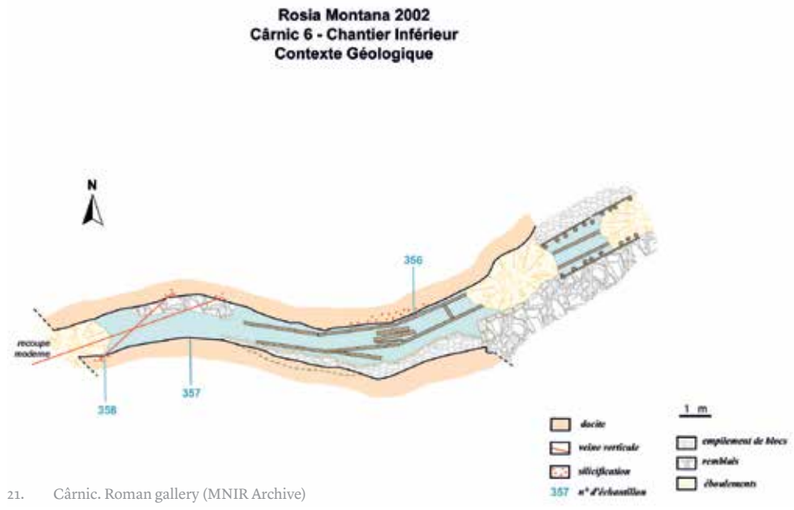
18. Roman mining works – room with pillars (© Lorin Niculae)

→ 1.1.5 Cârnic Roman fire-setting complex



19. Fire-setting complex (MNIR Archive)

→ 1.1.6 Cârnic Early Modern Galleries



21. Cârnic. Roman gallery (MNIR Archive)

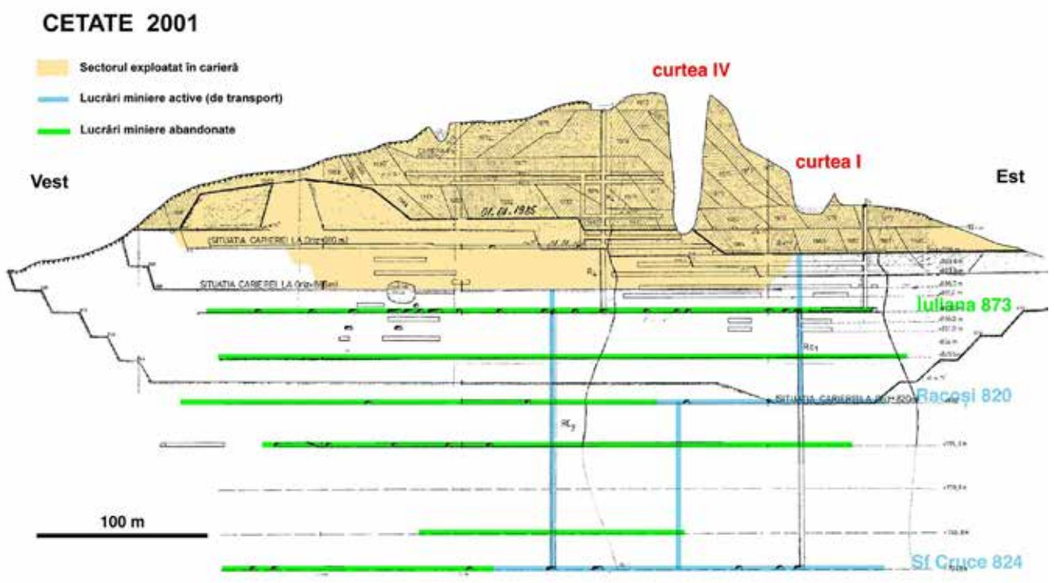
20. Cârnic Early Modern Gallery (MNIR Archive)

22. Cârnic Modern works – “caverns” (© Ivan Rous)

→ 1.1.7 Cătălina Monulești Early Modern Galleries

23. Cătălina Monulești. Modern pillar alongside Roman gallery (© Călin Tămaș)

→ 1.1.8 Cetate Early Modern Galleries



24. Cetate Early Modern galleries (MNIR Archive)

Beneath the floor of Cetate pit there is a modern underground network of workings along veins and in extraction chambers. All levels are interconnected by shafts and caverns.

25. Văidoaia. Medieval and modern open works (© Lorin Niculae)

→ 1.1.9 Văidoaia Massif: Early Modern underground workings

Mining works in Văidoaia Massif are thought to be Medieval or Early Modern. Also, surface Roman exploitations vestiges can be expected to be detected.

1.2 Mining exploitation: Surface

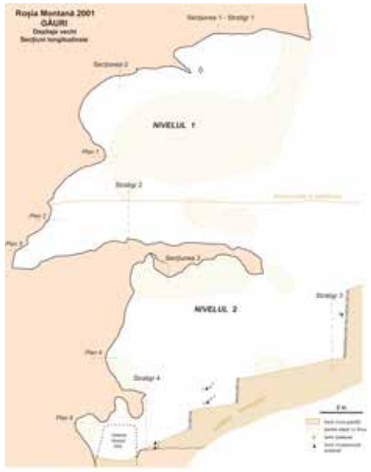
→ 1.2.1 Cârnic Roman Openworks

Intensive archaeological excavations have been conducted at Cârnic Massif in Piatra Corbului area where vestiges of surface Roman exploitations are in evidence.

26. Cârnic-Piatra Corbului Roman slope-side works opened with fire and water (© Horia Ciugudean)

→ 1.2.2 Cetate Roman Open Pit

Intensive archaeological excavations have been conducted at Cârnic Massif in Piatra Corbului area where vestiges of surface Roman exploitations are in evidence.



27. Cetate - Găuri Area: Roman works opened with fire and water (MNIR Archive)

1.3 Ore-processing features: Header Ponds

An extensive network of header ponds was created, probably incorporating pre-existing ponds, starting in the first half of 18th century. Set into favourable positions on the slopes of the mountains surrounding Roșia Montană and Corna, they gather water from springs and streams, from rain and melting snow, kept by artificial dams. The dams of the larger ponds – Mare, Corna, Țarina, Brazi, Anghel, Găuri – are built of substantial well-engineered earth embankments lined and faced with stone, sometimes with particular architecture elements to define the sluice outlets at their base. Sophisticated water supply control mechanisms were installed in the larger ponds, and survive in good condition.

After the cessation of traditional mining they were abandoned, absorbed into the natural and agricultural landscape and developed specific ecosystems of high natural significance. They contribute significantly to the character of the entire property.

→ 1.3.1 Tăul Mare

The largest of all the header ponds in Roșia Montană, *Tăul Mare* is also among the first to be (re)built in the 18th century, starting in 1733. It is set at an altitude of 1025 m, it covers an area of 40,000 m2 and retains 200,000 m3 of water behind a 110 m dam, 25 m high. It has been enlarged, reinforced and repaired several times, from the late 18th century, in 1779, to 1913 and 1929.

Its sluice outlet portal, dated 1913 on its keystone, is among the examples of fine architectural detailing, typical for early industrial architecture in the area.

Today the dam is overgrown with high vegetation, which hides it from view and poses a serious problem for its conservation, an issue to be addressed in the forthcoming Property Management Plan.

28. Tăul Mare (© Radu Sălcudean)

29. Tăul Mare after the reinforcement works of 1929 (Postcard. Unattributed)

→ 1.3.2 Tăul Țarina

Set high above Roșia Montană, on the slopes of Țarina, at an altitude of 950 m, it covers 8,500 m² and has a capacity of 25,000 m³ of water. Its dam is made of earth, clad in stone. The sluice outlet chamber opens at the base of the dam through a fine stone portal.

It was enlarged in 1779. Of its repairs, the most important happened in 1914. Now it is covered by young forest vegetation.

Upstream from it there are several other smaller ponds, gathering the waters from the surrounding slopes and flowing in a cascade from one to the next.

30. Tăul Țarina (© Lorin Niculae)

→ 1.3.3 Tăul Corna

Set at an altitude of 965 m, above the village of Corna, bellow the peaks of Cârnic - Piatra Corbului, Ghergheleu and Citera, the pond is defined by its sinusoidal dam, with the most elaborate architectural portal at its sluice outlet. Like the others, it is overgrown with vegetation and will be subject to conservation management.

31. Tăul Corna (© Sebastian Florian)

→ 1.3.4 Tăul Brazi
1.3.5 Tăul Anghel

The two header ponds are one next to the other, set at the upper, eastern end of Roșia Valley, just above the last houses of the mining town. *Tăul Anghel* is higher, set at 990 m, at the rim of the slopes closing *Tăul Brazi*, at 950 m. Together they illustrate the network approach to the ore processing water management of the mining site.

Tăul Brazi had a small wooden control cabin on its dam, now lost. Today the pond is used for recreational aestival activity.

Tăul Anghel is highly overgrown, which makes it less visible and raises conservation issues that will be dealt with in the forthcoming Property Management Plan.

32. Tăul Brazi (Arthur Oskar Bach)

33. Tăul Brazi and Tăul Anghel (© Radu Sălcudean)

→ 1.3.6 Tăul Cartuș

34. Tăul Cartuș (MNIR Archive)

→ 1.3.7 Tăul Țapului

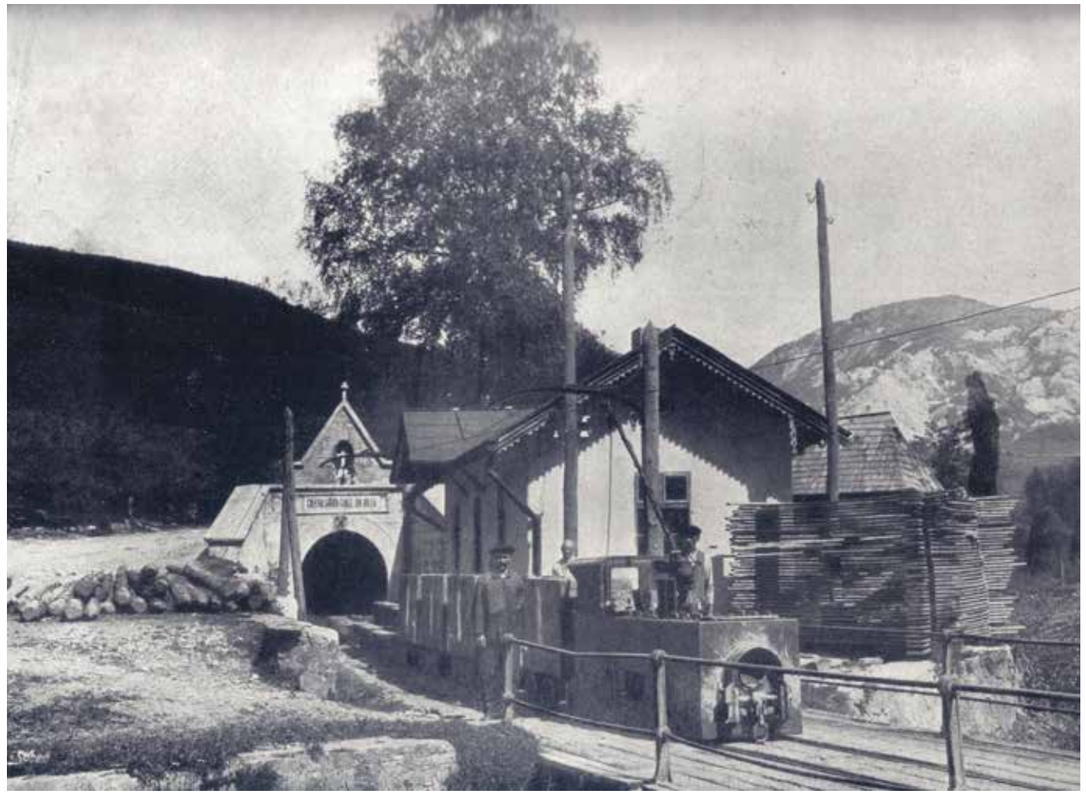
35. Tăul Țapului (MNIR Archive)

→ 1.3.8 Tăul Găuri

36. Tăul Găuri (MNIR Archive)

→ 1.3.9 Ore Railway

The property boundary has been extended to include the Ore Railway (mid 19th century) from the mining area to the site of the former ore-processing plant. Authenticity and integrity are high, including the impressive inclined plane section that descends to the current road where the property is terminated as integrity is compromised beyond. The line was decommissioned in 2006 and the track removed. However, most substantial engineering structure remains.



37. Holy Cross ore railway 1927 (V. Zotinca)

38. Ore railway incline (BNR Archive)

1.4 Mining administration

→ 1.4.1 State Mining Headquarters (18th – 20th centuries)
Roșia Montană no. 178

The headquarters were established here from the moment when the Habsburg government took over the organization of the underground mining and developed it on a large scale. It is therefore important for the modern history of mining in Roșia Montană.

The present buildings are transformed mid-19th century and again at the turn of 20th century, on the background of the 18th century structures. The headquarters include the roll-call house with the mine entrance shaft, offices and housing for the higher staff, along with ancillary buildings. Set apart from these, lies the house of the mine leader. The architecture is restrained but distinctive, with several features specific to early industrial architecture in the area.

It incorporates in the former roll-call house a descent into the "Holy Cross" master gallery, dug in the time of Empress Maria Theresa. This unites all major operating systems underground. Today it is still the headquarters of the state mine, hosting as well the local mining museum.

39. State mine headquarters. Roll-call room and shaft leading to the mines (V. Zotinca)

→ 1.4.2 Miners' dormitory (early 20th century)
Roșia Montană no. 185

40. Miners' dormitory (INP Archive)

→ 1.4.3 Mining Professional School (late 19th century)
Roșia Montană no. 208

41. Mining Professional School (INP Archive)

2 Archaeological Areas

2.1 Roman archaeological areas

Ancient archaeological monuments have been grouped into three typologies:

→ Residential areas with accompanying infrastructure (Hop-Găuri, Hăbad, Tăul Țapului, Carpeni Hill);

→ Sacred areas with temples (Hăbad, Nanului Valley and possibly Carpeni);

→ Zone funeral (cremation necropolises - Hop, Tăul Corna, Jig-Piciorag, Țarina Pârâul Porcului - Tăul Secuilor and groups of graves in the Nanului Valley and Carpeni Hill).

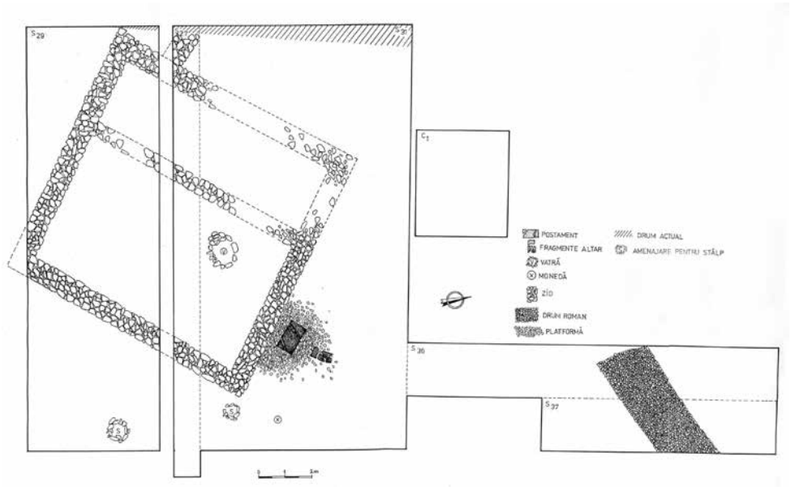
The funerary practices of the ancient populations that were colonised at Alburnus Maior by the Romans feature strongly in archaeological revelations: notably 7 necropolises (Hop Găuri, Tăul Corna, Țarina, Pârâul Porcului / Tăul Secuilor, Jig Piciorag, Carpeni and Szekely) and an outstanding Roman funerary precinct at Tăul Găuri, with more than 1,450 cremation graves.

Apart from significances conferred upon individual archaeological sites, the characteristics and distribution in the landscape of necropolises on the slopes and plateaus, as well as habitat and sacred places, provides data to help reconstruct an ancient local topography that was intimately associated with ancient gold mining and processing areas. Remains of habitations, sacred areas, necropolises and funerary areas, together with evidence of ore-processing activities integrated within dwellings, and paved Roman roads, are buried beneath a shallow earth veneer and are more or less well preserved.

Artefacts discovered (particularly during preventive archaeological campaigns) include an astonishing more than 70 votive altars in 2001–02, alone. The artefact collection also includes everyday Roman ceramics and pieces of funerary architecture – over 10,000 items, their conservation undertaken by specialised staff in the laboratories of a number of Romanian museums. Much has been published, and new interpretations that have emerged from the discoveries at Roșia Montană have laid foundations in defining new directions for the research of Roman Dacia.

→ 2.1.1 Hăbad Sacred Area

This is the site that comprises the remains of buildings that are associated with inscribed altars that provide information on the mining community and its religious beliefs, as well as ancient toponyms on guild organisations (collegia).



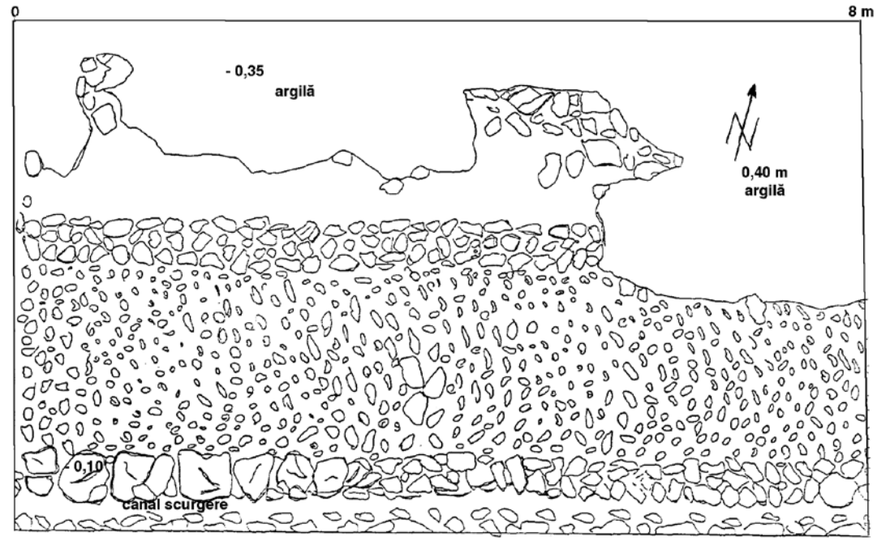
42. Building in the sacred area of Hăbad (MNIR Archive)

1 2 3

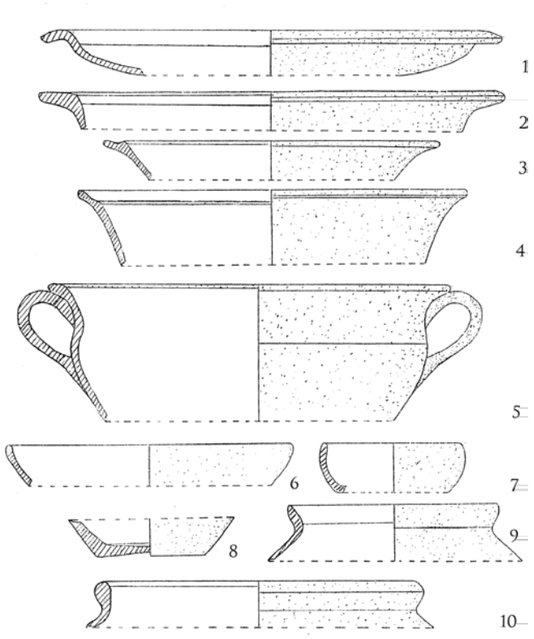
44. Hăbad votive altars (MNIR Archive)

43. General view of the excavation area in Hăbad (MNIR Archive)

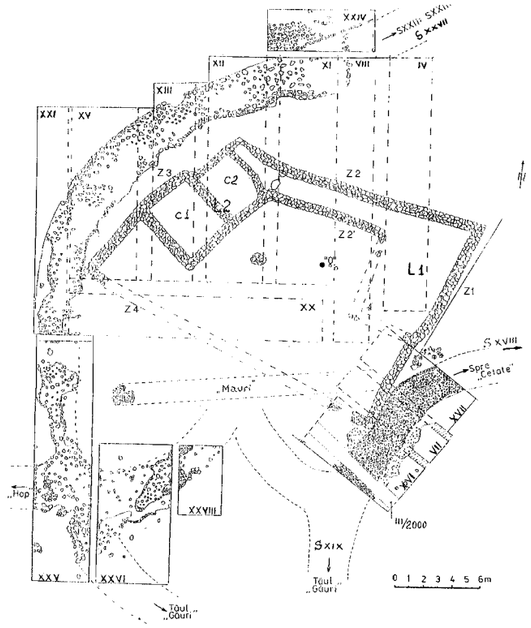
→ 2.1.2 Găuri – habitation



45. A section of the roman road crossing the site in the Găuri area. (MNIR Archive)



46. Roman pottery recovered from inside the dwelling in the Găuri section (MNIR Archive)



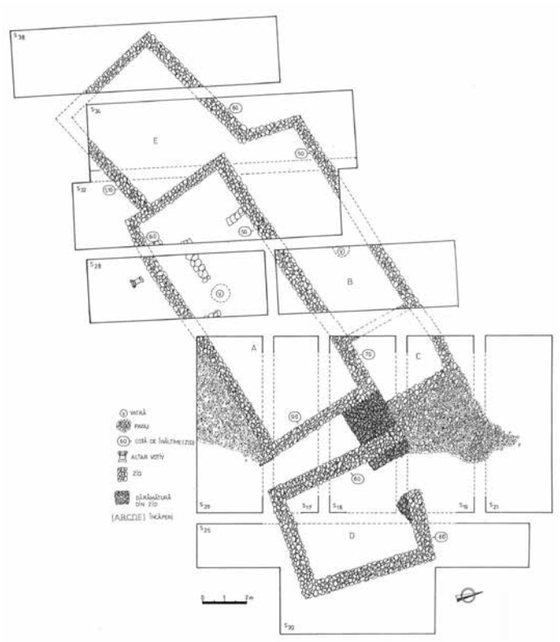
47. Plan of the dwelling in the Găuri section (MNIR Archive)

48. Detail of dwelling in the Găuri section (MNIR Archive)

49. Excavated habitat structures in Găuri area (MNIR Archive)

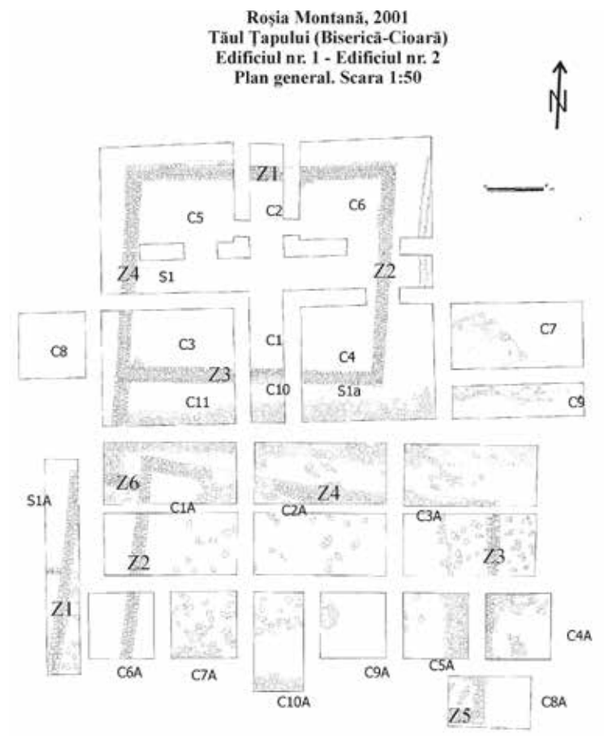
→ 2.1.3 Hăbad – habitation

50. Roman pottery recovered from the dwelling in the Hăbad section (MNIR Archive)



51. Plan of Roman dwelling in Hăbad section (MNIR Archive)

→ 2.1.4 Tăul Țapului archaeological area



52. Plan of Building no. 1 - Building no. 2 at Tăul Țapului (MNIR Archive)

→ 2.1.5 Hop Necropolis

The discovery, restoration and conservation in situ of the Tăul Găuri circular funerary monument remains a rare example in Romania. It is a stone circular mausoleum, with a drum of ashlar blocks enclosing a low tumulus over two phases of primary cremation burials.

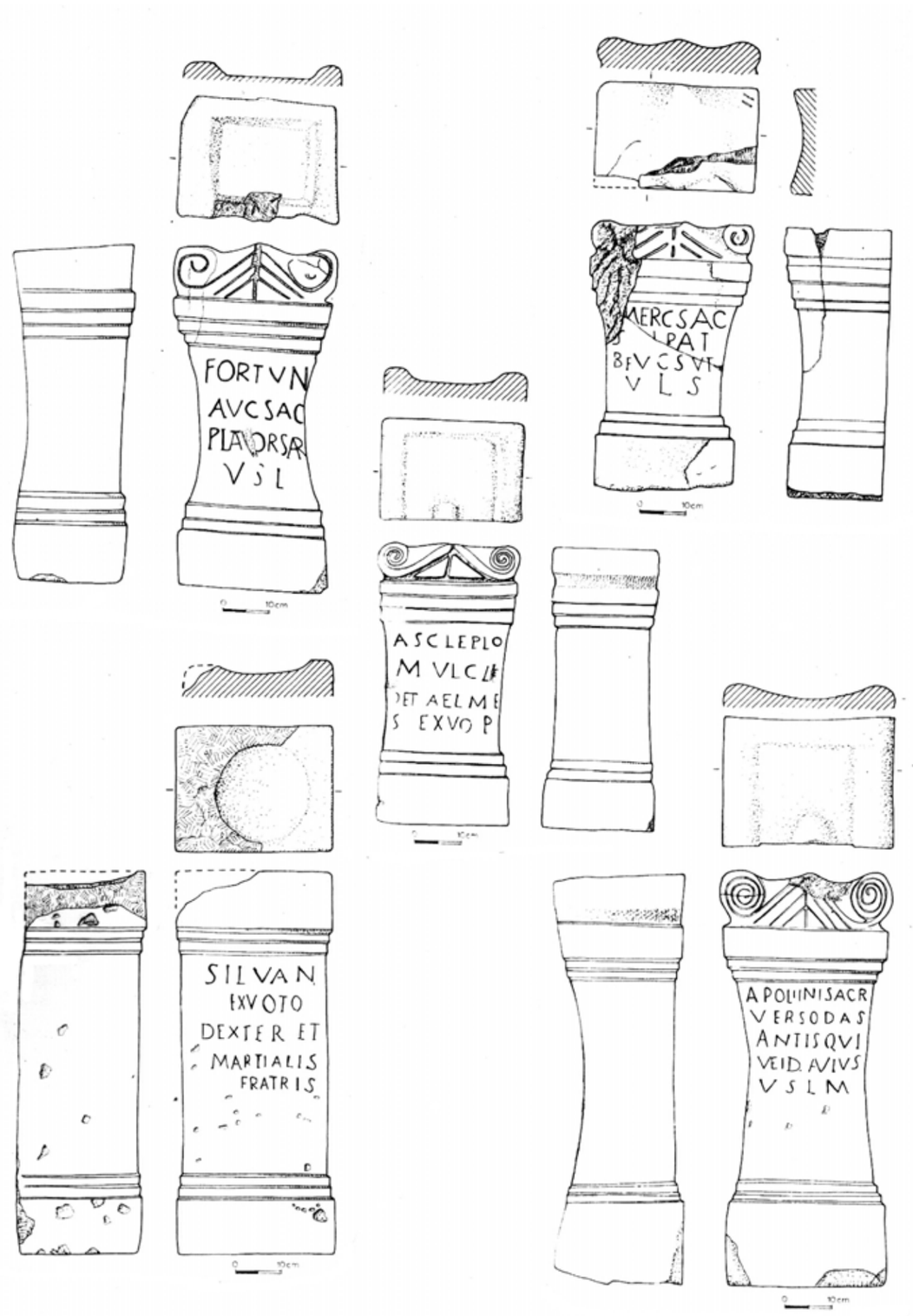
53. The circular monument in the foreground with Hop Necropolis in the background (MNIR Archive)

→ 2.1.6 Nanului Valley Sacred Zone

Extensive archaeological excavations have taken place in the Nanului Valley and sacred places ('temple' complexes) have been identified at Szekely, Tomuș, Drumuș and Dalea, with a Funerary Area at Drumuș – Szekely.

54. Nanului Valey general view of TII worship edifice (MNIR Archive)

55. General view of Dalea sacred space in Nanului valley (MNIR Archive)



56. Roman altars and pottery are amongst the principal artefacts recovered from Nanului Valey–Dalea (MNIR Archive)

→ 2.1.7 Carpeni Zone

Carpeni Hill has been the target of preliminary archaeological excavations and in situ preservation of the entire area (surface and underground). A habitation area identified on the hill comprises a series of Roman public buildings with hypocaustum (e.g. Bisericuță and Tomuș) that emphasise a potential administrative role and are to be considered in relationship with a possible sacred area and a funerary zone in the western sector.

57. Artefacts recovered from Carpeni Hill: Trajan coins minted in Caria Province, Asia Minor (MNIR Archive)

58. Silver buckle from Carpeni Hill; Ceramic roof tile with stamp Leg. XIII Gemina (MNIR Archive)

→ 2.1.8 Jig-Piciorag Area

There is a Roman cremation necropolis, and an ancient primary ore-processing site at Jig Piciorag. Artefacts recovered include Roman pottery and costume adornments.

59. General view from the east of the point Bara (MNIR Archive)

60. General view of the properties Gomboș and Bara, from the north (MNIR Archive)

→ 2.1.9 Tăul Țarina

In the present state of research there have been identified and excavated cremation graves (on-the-spot or *ad ustrina* cremation types), with elements of funerary architecture and funerary enclosures.

61. Funerary precint from Țarina area (MNIR Archive)

62. Decoration from the funerary precint in Țarina (MNIR Archive)

→ 2.1.10 Pârâul Porcului – Tăul Secuilor

Extensive archaeological excavations have taken place at Pârâul Porcului - Tăul Secuilor. A Roman necropolis of the 2nd century CE was discovered, with 287 cremation graves identified and 277 excavated. The relationship with other buildings nearby is as yet unclear. Artefacts recovered include Roman altars, pottery, elaborate funerary architectural elements, costume adornments, coins and glassware.

63. Funerary precint from Pârâul Porcului – Tăul Secuilor area (MNIR Archives)

→ 2.1.10 Tăul Cornei – Corna Sat Zone

Extensive archaeological excavations have taken place in Tăul Cornei and Corna village area. A Roman cremation necropolis was located close to Tăul Cornei.Artefacts discovered include Roman altars, pottery, funerary architectural elements, costumes, coins and glassware

64. Tăul Corna. Overall view of the necropolis. View of Citera Budeștilor (MNIR Archive)

→ 2.1.11 Balmoșești – Islaz Area

Preliminary archaeological evaluation, the character of archaeological research being confined to surveys, does not provide sufficient data for more than a preliminary assessment of cultural resources. However, earlier archaeological investigations suggested a Bronze Age date for several features, and possible Roman date for others. This area has been prudently included within the property for its archaeological potential, particularly the perceived linkages between gold and local Bronze Age culture.

65. Islaz Fortification (MNIR Archive)

3 Built heritage features

3.1 Town / village: Roșia Montană (Modern)

In Roșia Montană there are currently (2016) 43 architectural structures placed on the national list of historical monuments. The existing historic building stock dates mostly from the 18th to early 20th century, with few conspicuous later additions.

The general structure of the town and its street pattern respond to the territorial distribution of extraction areas, with two main nuclei, one – the administrative centre – set between Orlea and Cetate massifs, the other one – the historic centre – between Jig-Văidoaia, Lety and Cârnic. The numerous now-abandoned public functions set into the town centre speak of prosperity and of the bustling life of gold mining, and so do the conspicuous 'cultured' features of the street façades of houses. Starting from the Square, where the public activities were concentrated in an urban architectural ensemble with a strong representational character, the urban structure gradually dilutes into the mining-and-agro-pastoral suburbs which are represented by loose groups of households which combine common agricultural areas and annexes – barns and pens and gardens – with traditional processing installations and spaces or even mine adits opening in their backyards.

The overall image of the town, as a built landscape, is defined to a considerable degree by the materiality of its architecture. This, however, has changed during the past decades, with cement renders often taking the place of the bright whitewashed lime plaster, and tin or even corrugated cement taking place of the soft and perfectly integrated wooden shingle. This is an aspect to be dealt with in the Property Management Plan.

→ Neighbourhoods

→ 3.1.1 Square

An ethnically mixed population belonging to the economic and social elites inhabited "Piața" (the Square) and its immediate neighbourhood, the former economic and administrative centre of the locality. The presence of three churches (Roman Catholic, Calvinist and Unitarian), grouped in this limited area, defines the image of a religious and cosmopolitan society without tracing strict boundaries on ethnic or religious means. However, the social demarcation is here clearly visible by the scale and preciousness of the architecture.

The former site of the weekly fair has an irregular shape, with slightly sloping level, surrounded by two storey buildings, in compact fronts, as an amphitheatre at the eastern end of the main street.

66. Central area with three churches: Unitarian (left), Calvinist (centre), Roman Catholic (right) (postcard)

→ 3.1.1 a

cluster: Townhouses with commercial ground floors; no. 323–328, 388 (late 18th – early 19th century).

This group of houses with urban aspect on the north-eastern and south-eastern fronts of the Square generates one of the main landmarks of Roșia Montană. With commercial – shops, pubs, workshops – spaces to the ground floor and living spaces on the first floor, opening up towards the Square through many shop-windows and windows, with their facades decorated with insignia and historicist stuccos at the first floor, they lend to this upper nucleus of the locality the character of a typical small town in the time of the Austrian and Austrian-Hungarian Empire.

Despite being to a large extent inscribed in the local typology, with a porch to the courtyard, all these houses exhibit an elaborate decor facing the street, like an urban scenography set against a mostly rural background.

Four of the houses – nos. 324, 326, 327, 328 – are individually listed as historical monuments

67. North-east front of the Square. Early 1940s (© Silviu Bocaniciu Sr.)

→ 3.1.1 b

cluster: "Sicilian Street"

The street, its starting point in the Square, follows a sinuous path with the same urban character - continued fronts of two-storey houses. It is narrow and without sidewalks, and preserves (under the recent asphalt) the historic cobblestone pavement. Basalt blocks protect the facades against the vehicles. Houses no. 390, 391, 393, 395, 397, 398, are all individually listed as historical monuments. In spite of this, house no. 393 collapsed through neglect.

→ 3.1.1 c

cluster: Roman-Catholic Church and parish ensemble (18th – middle 19th, early 20th century)

The church, no. 549; 1866: historical monument – the largest among the places of worship in Roșia Montană dominates the historical centre from a high plateau at the south-east of the Square, looming its white, stern neoclassical silhouette on the slopes of Cârnic mountain marked by mining.

A cultural landscape shaped by mining: the Roman-Catholic Church at the foot of Carnic Massif and a backdrop of a steep scree of mined waste rock. Surrounding it, the cemetery (no. 549B), dressed in dense trees, descends to the Square and contains the Chapel (no. 549A) that marks the site of the first Catholic church. Recent archaeological excavations have revealed that the terrace behind the church is an old dump. Near the church there is the Catholic rectory (no. 317), the Parish school and culture hall (no. 318 – now the public cultural centre), the bell-ringer's house (no. 319 – recently collapsed and later demolished) and the teachers' house (no. 320). They are large buildings revealing urban aspect and structure. Apart from the bell-ringer's house, which has, traditionally, the first level in stone and the second level in wood, these buildings are entirely of stone and brick masonry.

→ 3.1.1 d

cluster: Unitarian Church and parish ensemble

The Unitarian church (16th Century; rebuilt 1796), no. 530 - set on a plateau, dominates the Square from the northeast, in a dialog with the Roman-Catholic church to the opposite side. The exact date of its reconstruction, 1796, is recorded in an inscription.

The Unitarian Parish House (no. 391) and the chorister's house (no. 390) as well as the bell-ringer's house (no. 553) define by their massive, particular silhouettes, the crossroad in the eastern corner of the Square, at the starting point of Sicilian Street.

→ 3.1.1 e

The Casino (1880–1900), no. 329, and summer garden

The Casino served as a bar, cinema, ball-room and general place of celebration until recently, when it was abandoned. The main hall preserves a wooden board vaulted ceiling.

On its side and to the rear the Casino connects to the once Summer garden, where a brass band would have played in a gazebo, on the higher platform of this small public park. The high trees, alleys and platforms are still preserved.

→ 3.1.1 f

The former Administrative Palace (1896), no. 310

The headquarters of all the public services of the village, is located in close proximity to the Square. Together with the State school and kindergarten (no. 274), it is among the last major investments of imperial administration in Roșia Montană. Sitting on a terrace to 2-3 m above the street level, it dominates the entrance to the Square by its classicized proportions, order and decorations.

→ 3.1.2

Brazi neighbourhood

The area spreads along a few ascending ridgelines and valleys, south-east of the Square, towards the Brazi header pond. It comprises several outstanding historic dwellings, with Baroque and Classical character, and many others characteristic for the Interwar period. They are all set into a diffuse historical fabric, with mostly historical buildings, a not much altered street pattern and streetscape – with cobbled steep and rugged streets, fenced by dry stone walls and tree lines.

→ 3.1.3

Ieruga neighbourhood

A particular small group of houses, concentrated around a crossroads up street from the Square, this neighbourhood features three massive houses, of Baroque allure (nos. 407-409), form the compact eastern front of a little square where the Ieruga mine used to be. Built around 1875, they represent a particular type of dwelling, preferred by the wealthy families of miners. Houses have walls and vaults of stone and brick at the first level and high second level built of wooden beams and plastered, containing up to 6 rooms. To the street, the large windows are fitted with "roștele" - iron bars with rich floral decorations. The roof of the house no. 407 keeps the voluminous, double sloped baroque structure. On the side facing the courtyard there is a generous

porch (Ro. târnaț). House and annexes surround the courtyard paved with stone slabs. In the yard no. 408, an underground cavity appears to be an old entrance to a mine gallery. The obstructed arch at the base of the façade indicates a former channel, which crossed the cellar to feed an ore washing basin ("jomp"). The sidewall, supported by buttresses contribute to the particular, unmistakable appearance of this area.

The smaller houses' position on the parcel is dependent on parcels' shape and the characteristics of the land, which often needs to be levelled, terraced and strengthened with dry stone walls ("maur"). On the north side of the little square, House no. 406 features the specific Interwar period traits – larger windows, gable roofs with trelliswork – and bears on the facade the year of building (1937) along with the mining insignia of the crossed hammers.

→ 3.1.4 Tăul Brazi neighbourhood

68. © Daniel Vrăbioiu

→ 3.1.5 Văidoaia neighbourhood

69. © Ștefan Bălici

→ 3.1.6 Berk neighbourhood

70. © Lorin Niculae

→ 3.1.7 Sosași neighbourhood

71. © Ștefan Bălici

→ 3.1.8 Orlea neighbourhood

3.1.8 a cluster: Greek-Catholic Church and parish ensemble

The Greek-Catholic Church of the Dormition (1720, 1741, mid 19th century), no. 135, stands on a terrace descending to the valley of Roșia at the foot of Orlea Massif, millennial area of gold mining. The church shares the lower, western core of the locality, concentrating around it the material and immaterial values of this predominantly Romanian area. The high bell tower, with its stepped, pyramidal roof erupts from this low position to dominate the image of Roșia Montană from any viewing angle. Thereby, the parish rectory (1815, 1854), no. 137, distinguishes between surrounding households through both age, size and position on the plot. Nearby, until 1918, stood the Greek Catholic confessional school built in 1868. In the cemetery is the tomb and memorial of Simion Balint, parish priest at this Church and leader of the 1848 Revolution, the most imposing local historic figure.

72. The Greek-Catholic Church of the Dormition (R. Slotta, V. Vollmann, I. Dordea)

→ 3.1.8 b cluster: Orthodox Church and parish ensemble

73. The Orthotox Church with Mt. Cetate in Background, Roșia Montană (V. Zotinca)

→ 3.1.8 c cluster: administrative centre – Town Hall

74. The administrative centre, Town Hall (INP Archive)

→ 3.1.9 Gura Minei neighbourhood

75. Gura Minei Neighbourhood, 1927 (V. Zotinca)

→ 3.1.10 Vercheș neighbourhood

→ 3.1.10 a cluster: representative houses along the main street

It includes the Ajtai House, later Miners' Club, the house used as Maternity ward, a pair of rural vernacular houses and the imposing Gritta House. The street front is loose, the houses alternating with wide empty spaces - orchards, gardens, pastures.

→ 3.1.10 b State school and kindergarten; no. 274 (1905–1915)

The ensemble occupies a large plot, unlike the small parcels of the neighbouring households, midway between the two centres of the village – the lower one around the Orthodox and Greek catholic churches and the upper, surrounding the Square. It is a large building, following an official architectural program and marks the last significant economic and demographic boom of the community. It is now under restoration, with significant changes to its historical layout (complete change of roof structure) and with the works interrupted

→ 3.1.10 c cluster: Blocks of flats in the sixties

76. Blocks of flats in the sixties (© Claudia Apostol)

3.2 Corna (Modern)

This is a village situated in the upper, more open, part of the Corna Valley. While some of the households are scattered on the slopes, the rest of the buildings gather around more compact nuclei, close to the two header ponds and the communal road. The lowest nucleus consists of several houses along the communal road. A second nucleus is formed around the two churches and several other public functions, below Tăul Cartuș, with plots distributed along the paths connecting to the upper part of the village. The upper part of the village consists of the third nucleus of houses, close to Tăul Corna. The last two nuclei are connected by a network of intertwining paths and were built in direct relation to the historical mining activity. The layout of the household is typical for the mountainous area, enhancing the rural appearance characterized by the lack of a continuous street front and the alternation of houses and gardens with different functions. As in the rest of the area, the sloped terrain determines adaptations of the house structure. Its skyline is defined by the presence of the churches, the open pit mining works on the Cetate quarry, Cârnic Massif and Piatra Corbului.

→ 3.2.1 Orthodox Church

This is the oldest church in the area of Roșia Montană, and it occupies a large flat plot in the widening of the Corna Valley. Built in 1719, it illustrates the church typology present in the Apuseni Mountains since the 18th century. It is part of a less compact nucleus of constructions, together with the parish house and public buildings such as the kindergarten or the cultural centre and a few other houses. The appearance of the public and private constructions, plastered but undecorated, with a traditional structure, and their position within the plots, is closer to the scattered village type of the area.

→ 3.2.2 Greek-Catholic Church

Surrounded by the cemetery and more detached from the village centre buildings' nucleus, the church is situated on a small, sloped plateau in the wider area of the Corna Valley. It dates from the 19th century, being an important landmark for the landscape of the village. It is smaller than the other churches in the area, but it also illustrates the typology of the stone-built churches of the Apuseni Mountains.

→ 3.2.3 Miners households

77. Upper nucleus in Corna village (© Lorin Nicolae)

3.3 Țarina (Modern)

Țarina is a village located near the eastern part of Mt. Orlea and its minefield, covering an area defined by hills with rather high slopes. This proximity to the minefiled had influenced the activities and generated the inhabitation of the territory in a very peculiar way. The Josephine Land Survey of the 18th century presents the settlement as a string of houses along the stream that comes from Țarina header pond.

The village followed the stream until it reaches Foieș (Roșia stream). Its location had favoured the construction of traditional houses, typical for miners: rather small constructions with ground floor made of stone masonry, while the single upper level was built of wooden beam construction, plastered on the inside.

The connection with the stream permitted the rise and use of stamping mills on both sides. Its natural hilly landscape had also been favourable for the other type of habitat: the typical mountain household.

Țarina is composed of three defined areas gathered along the main paths that historically linked Roșia Montană to Câmpeni and other villages from the north. The main paths have a northwest orientation, the easiest way the mountain could be crossed with oxen and carts.

The hierarchy of the paths leading to Tarina is influenced by the proximity to the Market Square.

Few traditional miners' households can be seen in the landscape close to the stream. The other two areas are more recent, with modern houses that reflect a peasant way of life.

→ 3.3.1 Traditional farmhouse (19th century), Țarina no. 1248

A representative example of a traditional house in Țarina, house no. 1248, built in the late nineteenth century. It has a spatial and functional structure typical for the area: the living part consists of two rooms accessible by the corridor and an annex – kitchen – added on one side of the house. The main level rises above a cellar which adjusts to the slope. The building system is also locally specific, representing a version of a widespread solution in the Apuseni. The 'Blockbau' system (log construction) with walls composed of horizontal beams arranged in crowns is applied here in a version with urban remnants. The basement walls are made of stone masonry and lime mortar, like the vault that used to cover the space. The roof is hipped and covered with shingles.

In the middle of the one room basement stands the mining 'jomp', a small shallow basin used to retain the water for washing the processed ore during winter time. Signs of a previous stamping mill could be read in the terrain configuration.

78. 19th century Traditional farmhouse, Țarina (© Ștefan Bâlici)

→ 3.3.2 Traditional farmhouse (20th century), with polygonal stable

Located on the fringe of the Orlea mining field, where miners gathered the rocks from the exploitation, the house presents vernacular and mining features. It is built with two storeys. The cellar is made of stone masonry, having two rooms covered with wooden beams. The upper level is accessible from the traditional corridor, exposing two rooms. The outside plaster still preserves blue paint, used as traditional rendering.

Close to the house is the old stable, a peculiar wooden construction with four sides, of which one has a polygonal shape. This feature is said to be inspired by rural architecture, as a response to harsh windy weather conditions. It was used for sheep and cattle. The high loft was used as a hay stockpile.

79. Traditional farmhouse with polygonal stable (© Ștefan Bâlici)

3.4 Balmoșești - Blidești (Modern)

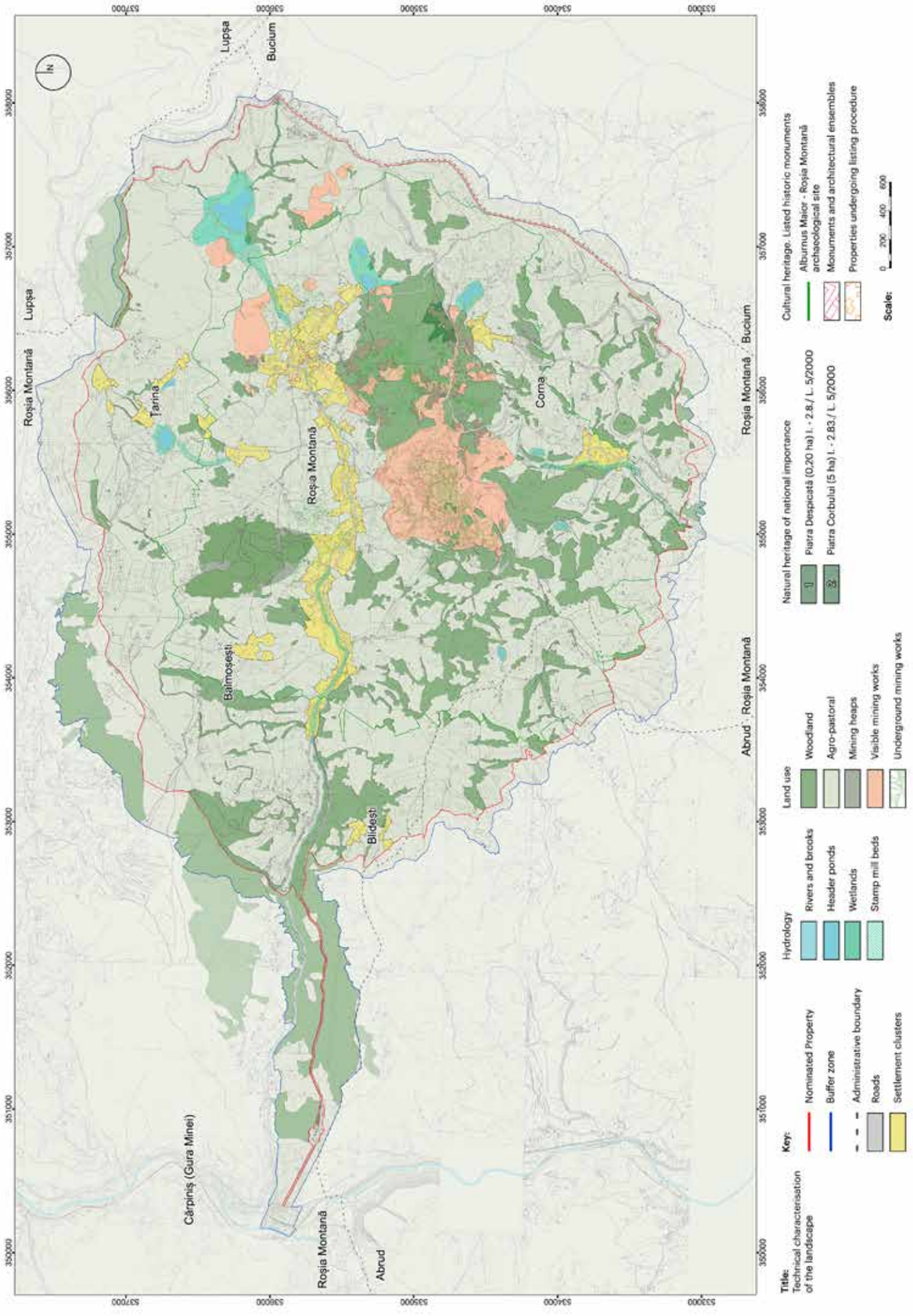
Balmoșești, one of the smallest satellite-villages of Roșia Montană, is located on the northern slopes of Roșia valley, west of Mt. Orlea. Its importance lays in adding a rural layer to the mining area. This settlement is formed of simple scattered houses with modern appearance (modern vernacular style), built mainly in the 20th century.

The households are close to the main path, an unpaved road that follows the slopes of the mountain. The path leaves Roșia Montană, near the Mining Enterprise ensemble, going around Orlea quarry and ascending towards northwest. The settlement is approximately at half the distance from the starting point to the top of the mountainside. A small artificial lake lays over the settlement, as a sign of a possible small-scale mining background.

Blidești (Modern)

Another satellite village of Roșia Montană, Blidești stands on the western section of the southern slopes that define Roșia valley. Hidden from the daily routes, Blidești is linked with Corna valley through a northwest oriented path. It comprises three groups of scattered buildings. Of all Roșia Montană valley this settlement has the fewest households, being inhabited by a small number of families as their houses with annexes show.

80. Piatra Corbului, protected area of national interest
(© Edmond Kreibic)



The altitude ranges between 600–1200m and the physical elements that define the geographical landscape are the peaks (900–1100 m altitude) with amplitude, depth and filtered perspectives by the forestland and meadows and the valleys (500-800 m altitude) with meadow landscape and dry valleys. The geographical landscape is modelled also on the hydrographic network and the geological structure of the mountains:

The landforms dominate the territory to the south, east and north by the Tile (918m), Cetate, Cârnic (1807m), Ghergheleu (1157m), Rotundul (1187m), Brădețel (1011m), Ghipidele (1050m) and Coltău Hill (1094m). Due to differences in height of 700-800m and different hardness and composition of rocks, erosion and human activities has contributed extensively to shape the land.

The hydrological network is formed by streams flowing into the Roșia and Corna Valley and the header ponds used in the past to serve the streams for the stamp mills. Groundwater gravity-flow mine drainage enters the rivers Roșia and Corna, as do tributaries from the Roșia Montană commune.

Reserves and Monuments of Nature

There are two protected geological sites: Piatra Despicată (Cleft Stone) and Piatra Corbului (Raven's Stone), are protected areas of national interest (ZNPIN) and natural monuments and were defined by Law no. 5/2000 - Law of the approval of National Spatial Development Plan- Section III - Protected Areas.

Both sites were formed at the beginning of the Quaternary.

Piatra Despicată, with an area of 0.25 hectares, is located 1 km southwest of Roșia Montană, between Cârnic and Cetate peaks and has isolated aspect of block resistant to erosion.

The site was declared a "natural monument" in 1954. Its geological composition is different from the geology of the area, being an andesite block, weighing several tonnes, located over the dacite rock of Cârnic Massif. It is believed that the stone block gained its current location after a volcanic explosion from the Ore Mountains produced in the last phase of the Neogene period approximately 15–20 million years ago.

Piatra Corbului with an area of 5 ha, situated between Ghergheleu and Curmătura peaks, surrounded to the east and west roads that go to Roșia Poieni mining area. The natural reserve is situated at 1100–1150 m altitude, with an aspect of black basalt.

81. View on Piatra Corbului and Cârnic Massif – Southern slope (© Radu Sălcudean)

Landscape character types: Agro-pastoral landscape

82. Overall view of Roșia Montană Mining Landscape (© Petru Mortu)

Land management, for industrial and agro-pastoral practices, takes places on plateaus and steep slopes. Consists of: pastures, hay-meadows, meadows adjacent to the village, orchards, interspersed with small patches of arable land. It is widespread in the territory and also on perimeter settlements.

Human intervention in this landscape is of considerably lower intensity compared to other similar areas in the Apuseni mountains. Thus, pastures, orchards and meadows have been continually maintained with a low intensity land use and traditional practice that is highly beneficial for species richness. Cattle grazing and crop rotation biennial or triennial systems (ploughing one year and fallow for two or three years) and soil terracing sustains land fertility.

83. View of Tăul Mare and surrounding area. Field patterns: spatial arrangement of the keys elements and shape of landscape plots. (© Radu Sălcudean)

Hay-meadows adjacent to the pastures are colourful and species-rich with the presence of "6520 Mountain hay-meadows" (Annexe 1 of the EU Habitats Directive), 'High Nature Value' meadow habitat. Lower fields around the settlements receive more fertilization, in the form of animal dung, than the other with more nutrient-poor hay-meadows. The pastures near the ponds are "6230 Species-rich Nardus grassland, on siliceous substrates in mountain areas" listed as a priority habitat in Annexe 1 of the EU Habitats Directive.

84. View on cattle stable with an agro-pastoral production facility with solitary trees which through particular usage or historical tradition gain a specific significance; high cultural and historical value and biodiversity potential. (© Radu Sălcudean)

The agro-pastoral landscape, woodland, the hydrological network, archaeological sites and mining exploitation areas, are defined by distinctive morphologies and typologies due to process characteristics and in relation to the settlement.

85. Rough grazings with terraced field and shrubs succesion in the background (© Radu Sălcudean)

There are fields elongated perpendicular to the slope. A difference of the texture fragmentation is visible between the Țarina, Balmoșești, Blidești areas, where the agro-pastoral landscape is less fragmented and dominant due to the geographical characteristics of the Corna Valley, where is more fragmented and interspersed with the woodland and industrial landscapes. Different types (sub-units) of the agro-pastoral landscape are bounded by plantation property boundaries, fences or dry stone masonry ("mauri"), for example in the meadows around the settlements (Roșia Montană, Țarina).

86. Small trees hedge with individual trees, fences and dry stone masonry and crosses to delineate or mark boundaries (© Radu Sălcudean, Mihaela Hărmănescu)

Landscape value is enhanced by the good state of preservation of specific plant habitats, protected and rare plants cited in the Red List of Plants in Romania and Romanian rare vulnerable Inventory of meadows (2003).

Rocks and stony ground landscape

On the highest slopes toward the top of the hill, inside the pastures areas there are rocks and stony ground characterized by "natural rock gardens" where vegetation is influenced by the secondary effects of metalliferous mineralisation.

87. Natural rock gardens (© Daniel Vrăbioiu)

Woodland / Forest landscape

Woodland occupies the altitudinal area between 600 - 1200 m, with a distinctive substrate and micro-climate sometimes leading to the phenomena of vegetation inversion. The landscape is characterized by the deciduous and coniferous forests and the woodlands stretch over small fragmented areas with different utilities. The spread of deciduous trees is inside the inhabited area and on the southern slopes of the Jig and Văidoaia massifs, in the eastern part delimiting the settlement and Tăul Mare.

Due to characteristic processes, the background southeast of Roșia Montană is heavily vegetated with coniferous woodland (on Cârnic), linking historic extraction and agro-pastoral landscapes. Woodland is also characterized by deciduous stands. Along with the presence of species and training for fixing the sterile soil (junipers), vegetable groups punctuate the whole area near Roșia Montană - becoming stronger environmental elements.

Conifers, massive trees and resinous shrubs are spread on rocky substrate on the north slope of Cârnic, in Tăul Brazi and Corna areas. These create a natural reinforcement of the soil against erosion, landslides and the formation of debris. They also contribute to soil formation.

88. Forest in relation with mining exploitation with high historical and cultural value and high ecological potential (© Radu Sălcudean)

Another characteristic of the woodland are the trees with distinctive vegetation composite on watercourses and near the ponds that confirm the relation between nature and mining activity. Grouped trees and deciduous shrubs mark the limits of different properties (meadows, households) through linear plantations.

89. Hedgerows delineate boundaries, ponds, roads; they provide erosion protection and improve landscape (© Radu Sălcudean)

The resulting patchwork of fields, meadows, wetlands and woodlands created a unique pattern of land uses, which was carefully adapted to topographical conditions.

Wetland landscape/ Flushes and mires

These areas are defined along rivers, streams and ponds and are set in relation to the agro-pastoral landscape and woodland. They also derive from mining activities and water management.

The hydro-technical ensemble made by header ponds, and the installation of water control and routing, fundamentally changed the hydrology within the landscape. These artificial elements, arranged throughout the territory, were partially absorbed into the natural environment while generating lower specific wetland landscape (characterized by the relation between anthropogenic and natural elements), characterized by "High Natural Value" and rare aquatic vegetation with distinctive and unique acid bog (7110 on Annexe 1 of EU Habitats Directive). The cultural importance of these facilities is given by more harmonious (medieval) mining activity and its interaction with the natural environment. Meanwhile, the main ponds (Tăul Mare, Tăul Brazi, Tăul Corna) have become important geographical landmarks.

90. Tăul Brazi landscape (© Radu Sălcudean)

91. Former header ponds with water retention function and specific flora (© Radu Sălcudean)

Archaeological landscape

The archaeological heritage, through the way to adapt to the natural environment, is currently building a specific landscape: Necropolises, sacred areas and housing areas are subordinate to the natural environment through their arrangement on the terracing of slopes or high points with a broad perspective on the valley; probably directly related to mountain ranges and the place of gold ore exploitation.

→ The necropolises are located on slopes or on plateaus oriented towards the valleys, following the same script, where the southern orientation is favourable. There are seven necropolises: Tăul Cornei, Carpeni-Balea, Hop-Găuri, Valea Nanului, Pârâul Porcului, Țarina and Jig-Piciorag.

→ The sacred buildings are built on heights and probably were connected with entries to galleries. Sacred spaces were identified in five points: Hăbad-Oprișa, Hăbad-Brădoaia, Dalea, Szekely and Drumuș points.

→ Ancient habitat structure has housing systems typical for mountain areas and in direct relation with the mining activities.

→ The ore processing zone (at Jig-Piciorag Point) confirms that the ancient habitat is connected with the historical centre of Roșia Montană and Cârnic Massif (underground exploitation).

The representative landscape of archaeological sites scattered diffusely throughout the entire territory provides a comprehensive and accurate picture of the land topography and the ancient habitat both at micro scale by type and their position and large scale by the built landscape history as a whole.

92. General view of Roșia valley from Balmoșești (MNIR Archive)

Mining landscape

Important preserved mining landscapes bear testimonies to the history of Roman, medieval and modern mining, located at the edge of the settlement and beyond.

Roman period evidence is significant testimony to a concerted effort of around 50 years, in which one of the largest known underground Roman mining complexes developed at Roșia Montană. Medieval and modern testimonies are significant in terms of underground developments and of preindustrial ore processing.

Preindustrial exploitation profoundly impacted upon the natural landscape: header ponds, bare mountains, mine openings and the sites of stamp mills and water management infrastructure create distinctive features within the mining landscape. After the cessation of traditional mining, these traces of human activity have mellowed into the natural landscape.

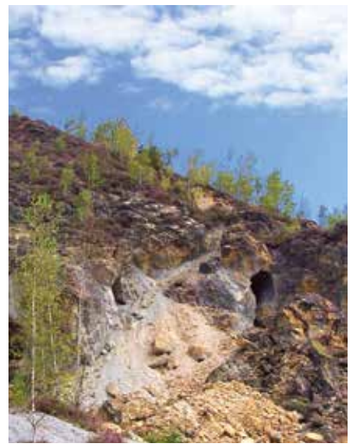
The landscape of the hydro-technical system is also characterized by a stream and pond infrastructure that formerly supplied the stamp mills in Corna, Roșia Valley and part of Țarina.

Rocks and debris from mining operations are characterized by specific habitats.

93. Overall view of the Tăul Mare and mining landscape (© Radu Sălcudean)

Landscape of surface mining exploitation:

Cârnic and Cetate massifs bear traces of traditional and modern (late 20th century) mining in the form of mine entrances and rocky slopes devoid of vegetation.



94. Mount Cârnic – vestiges of prehistoric and Roman slope-side works opened with fire and water (© Horia Ciugudean, Radu Sălcudean)

Mining exploitation underground network

The underground network is characterised by Roman galleries and early modern galleries. Roman galleries form a dense network excavated into the following massifs: Orlea, Carpeni, Cetate, Cârnic and Letea. Exploration, transport, ventilation and drainage galleries converge on mineral extraction areas. Traces of habitation and sacred areas highlighted on the south side of Rosia Valley (Carpeni and Valea Nan) link with the areas of ore exploitation of the Cetate and Orlea massifs.

Built–up (architectural) landscape

This landscape contains built–up elements: from ponds and their mining heaps to settlement and buildings. The typology and morphological structure of human settlements are in relation to natural elements and main activities. The following types are distinguished:

→ linearly developed along watercourses, valleys and the main roads, with interdependent relationships with water in the past (former stamp mills, in Roșia Montană, Corna, Țarina)

→ in the proximity of mining activities: mine accesses in Jig massif, Cârnic and Letea, mining heaps, historic earthworks, etc. influenced the settlement structure in the two main cores (the valley and historic centre)

→ in the proximity of woodlands, as an "extension" of the natural element (Blidești, Corna)

→ in the proximity of agro-pastoral landscape (Blidești, Balmoșești) with diffuse limits and types of the settlement.

Roșia Montană (550–580 m altitude)

Rural - urban type settlement with mixed structure related to geomorphology and topography: nuclei include the churches, various buildings, and areas of mining exploitation, and the core of Roșia Valley with the Roșia River (its use correlated with former stamp mills).

Mountain massifs, that are places of ore exploitation, constrain a settlement structure that ties in with the linear structure of the valley: Cetate and Orlea flanking the lower pole, with churches in the valley; and Jig Văidoaia, Letea and Cârnic around the higher pole of the historical centre. Anthropogenic changes in the landscape shaped for industrial purposes become a significant defining factor in the urban structure of settlement.

95. View on Roșia Montană, with the central area in the foreground. (© Radu Sălcudean)

Street network is not regular, small streets winding through properties, following the uneven, sinuous topography. Stones extracted during the mining exploitation and stone ground of stamps mills were used to pave the roads, properties delimitation and construction material.

The crossroads, public spaces and settlement boundary are marked by crosses, votive, memorial and funeral monuments adding symbolic, historical value to associated spaces.

96. Monument of World War I, ca. 1930; located next to a Memorial Cross, in front of one of the buildings of the mining administration (professional school, c.1910) (© Iozefina Postăvaru)
Cross "from Ghenoveva", located close to the Square, nearby the Casino, attached to house no. 331 (19th century) (© Iozefina Postăvaru)
Cross of Mihail Gritta, 1837, marks the grave of the rich miner and donor of churches, today overlaid by the street with blocks of flats dating from the 1960s (© Ioan Andron)
Cross, 19th century, located on the road to Tăul Brazi (© Iozefina Postăvaru)

Corna (600–800m altitude)

Rural settlement with mixed structure. One linear nucleus emerges along Corna Valley, whilst other concentrations are located around the churches and the ponds. In the highland area of the settlement, the limits are diffuse and allow passage from one property to another, related to the agro-pastoral activities and in the valley area. The limits are defined by natural elements and are in direct relation to the mining activities.

97. View on Corna churches with Cârnic and Cetate Peaks in the background, mining exploitations from the Roman to modern period (© Radu Sălcudean)

98. View on a habitation area in Corna Valley. (© Ștefan Angelescu)

Țarina(1004 m altitude)

Situated near the eastern part of Orlea Massif has also a mixt structure. The dwellings, close to Roșia Montană, were related to mining activities. In its upper part it is a scattered hamlet with agro-pastoral activities.

99. View on Tăul Țarina and Țarina hamlet with dispersed households on the hills (© Radu Sălcudean)

Balmoșești (846 m altitude) and Blidești (825m altitude) are rural/vernacular settlements (hamlets) with diffuse and scattered structure and natural limits, and rural households that are related to agro-pastoral activities. The hamlets' structure is typical for Apuseni Mountains' rural settlements: the households and outbuildings are situated in the middle or as extension of the property, perpendicular with the road and depending on the relief. Dispersed, the hamlets are settlements form with no communal facilities, and weak infrastructure.

Households are spread on the hills and their inhabitants are called "side – settlers" ("lăturени"), their main occupation being agriculture and cattle breeding. There is a temporary form of living of the hayfields where cattle stable and one-room buildings are situated.

100. Single farmstead with an agro-pastoral production facility (© Radu Sălcudean)

Priorities for management

- → maintenance of traditional use of agro-pastoral landscapes and the preservation of their habitats
- → maintenance of constitutive landscape elements such as boundaries, landmarks, enclosures, singular elements that contains testimonials of the historical evolution
- → the field margins of low intensity agro-pastoral land that often contains a diversity of flowers
- → preservation of the character of the landscape
- → maintenance of constitutive elements of landscape characteristics that support identity
- → reference to appropriate(heritage, archaeology, biodiversity, etc) strategies for different landscape types

2.a D Geological setting and Mineralisation

Geological setting

Roșia Montană is situated in the Apuseni Mountains, located in the heart of the Romanian Carpathians. Three main ore deposit districts are known in the Metalliferous Range, a very rich gold-silver province worked since the Roman period, and likely before (a selection of mines found within this province are listed in the annexe of the national comparative analysis). It is known as the *Golden Quadrilateral*, and for over two millennia it was one of Europe's principal goldfields.

The precious metals deposits (gold-silver) are epithermal in origin – deposited from warm waters at comparatively shallow depths under conditions of comparatively low temperature and pressure. The Roșia Montană deposit relates to two major events of Neogene volcanism/magmatism: Cetate dacite (13.5 - 1.1 million years ago) and andesites (9.3 – 0.47 million years ago).

The bulk of the gold-silver in the deposit is concentrated within two adjacent dacitic intrusives: Cetate and Cârnic; which appear to join at depth. Two main types of gold-silver mineralisation are present with the deposits - disseminated (within dacite) and breccia. Within the Cetate and Cârnic intrusives the highest-grade mineralisation is confined to sub-vertical breccia pipe structures (often containing fragments of crystalline basement). Two (Cetate and Carpeni) are located within the Cetate intrusive, and four (Napoleon, Corhuri, Cănțăliște and Piatra Corbului) are located within the Cârnic intrusive. Amongst these common breccia pipes, the largest is the Cetate Breccia that was mined at surface by the Romans (and possibly in prehistoric times, also) as evidenced by numerous historic photographs of the large opencast (the "Citadel"), mined-out during open pit operations from 1972 to 2006 for the low-grade gold the Romans left behind.

Surrounding the dacitic intrusives is a unit of volcanoclastic sediments that also hosts precious metal mineralisation. Situated between the Cetate and Cârnic intrusives, and extending along the southern boundary of the Cetate intrusive, is a breccia body known as the Black Breccia.

Mineralisation

Roșia Montană Mining Landscape is centred on a world-class gold deposit (with a low - intermediate sulphidation state). It comprises various types of ore bodies: veins, breccia structures (breccia pipes and breccia dykes), stockworks, and impregnations. The geological age of mineralisation is indicated around 12.7 million years ago.

Gold occurs as free gold, and in electrum (natural gold – silver alloy). In addition, silver minerals occur (argentite, proustite, polybasite), sulphides (common pyrite, and uncommon chalcopyrite, sphalerite, galena, tetrahedrite, arsenopyrite) and tellurides (hessite, sylvanite, petzite, altaite and Te-bearing argyrodite).

Gold grades decrease with depth, and a horizon of maximum concentration occurs. Geological investigations evidenced the skill of Roman period miners who chased high-grade gold values, only, restricting 'dead' work in barren ground only where necessary for access and transport, drainage and ventilation – and only then if they were not able to drive in mineralised ground.

Reserves and Monuments of Nature

There are two "Reserves and Monuments of Nature" within Roșia Montană Mining Landscape, comprising two rare geological formations, Piatra Corbului (Raven Stone) and Piatra Despicată (Cleft Stone).

The Raven Stone was declared a "monument of nature" in 1969 and placed within a protected area of 5 hectares. It is a mostly sheer-faced crag located at an altitude of 950 metres on the southern slope of Cârnic Massif, and in which Roman mining (and even possibly prehistoric mining) was conducted, including the use of primitive methods using fire, water and vinegar. The name of the monument comes from the shape of the stone, suggesting a raven's head, but also perhaps from the large number of ravens that nest in the area.

The Cleft Stone was declared a "natural monument" in 1954. Its geological composition is different from the geology of the area, being an andesite block, weighing several tonnes, located over the dacite rock of Cârnic Massif. It is believed that the stone block gained its current location after a volcanic explosion from the Ore Mountains produced in the last phase of the Neogene period approximately 15 – 20 million years ago.

2.a E Flora

Geological setting

Roșia Montană Mining Landscape is a cultural landscape that provides a distinctive habitat for rich botanical diversity. Geographical position, geology, mineralogy, climate, soil and hydrographical factors, together with prolonged anthropogenic interventions, have produced a distinctive territory characterised by a wide variety of typologies.

Two millennia, and more, of gold mining activity imposed substantial cumulative disruptive action upon the biogeography of the property. But that does not mean that the current ecosystem lacks biodiversity; the situation is quite the opposite – especially at the landscape scale. Indeed, a lack of modernisation in traditional agro-pastoral practice preserves what is effectively a relict Bronze Age landscape, set among scenery that is of high aesthetic value.

The property is characterised by a distinctive mosaic of natural and exposed rocky massifs strewn with metalliferous mine debris, lakes (former header ponds) that occupy the higher elevations, forest (coniferous and deciduous), mountain meadows and hayfields, and the built-up area of Roșia Montană village. In close proximity are semi-natural habitats of High Nature Value grasslands (oligotrophic pastures and mesotrophic hay-meadows, traditionally farmed and lush with wildflowers) and mires - listed in Annexe I of the EU Habitats Directive, together with orchids and other plant species that are Red-listed in Romania.

The following significant plant communities are present at Roșia Montană (Annexe I EU Habitats Directive listings shown where relevant, after Akeroyd, 2006):

HABITAT	SPECIES	LISTING
Metal-rich rock outcrops	Asplenium septentrionale Silene dubia subsp. Dubia. 'Dacian communities of fissures of siliceous rocks with Asplenium adiantum-nigram, Asplenium septentrionale and Silene nutans subsp. Dubia (Red listed as Near Threatened). 'Silceous rock with pioneer vegetation of the Sedo-Scleranthion'	EU 8230
Metal-rich mine debris	Metallophyte species	
Oligotrophic pastures, locally species-rich	'Acidophilous mountain Nardus pastures'	Priority habitat EU 6230
Oligotrophic, dwarf shrub, montane heaths		Lety Massif Roman Galleries: Cătălina Monulești Roman Galleries
Mesotrophic, montane, species-rich hay-meadows		EU 6520 Mountain hay-meadows
Base-rich mire	Eriophorum latifolium (Central European yellow-sedge fen)	
Acid mire	Drosera rotundifolia	EU 7110
Woodland edge	Alnus incana and Telekia speciosa – 'Alluvial forestsof the Alnion incanae'	Priority habitat EU 91E0

2 b History and Development

101. Traditional mining landscape in early 1940s (© Silviu Bocaniciu Sr.)

Introduction

Ancient *Alburnus Maior*, medieval *Rubeo Flumine*, Verespatak, Goldbach, Rotbach, Roșia de Munte and Roșia Montană: they are all the same place. Here an evolution almost exclusively determined by people's quest to exploit gold spans more than two millennia; perhaps even twice that. What is certain is that today we find a socio-technical palimpsest created by successive empires and cultures that has unparalleled time-depth, above and below ground. The landscape displays significant natural assets – some that determined the path of cultural interaction, and some that developed as a direct result of it. These attributes combine with cultural richness to produce a type of countryside that not only conveys authentic Romanian rural culture, but which also represents a traditional scene that has disappeared across much of Europe. This landscape, and the processes that shaped and sustain it, is not just property with an inventory. It gives us a point of entry into a common emotional ground of memory and belonging. It is a precious asset that needs to be fully understood in order to value it, and then one might hope to share in the knowledge of those that truly care for it.

That the highest values must be assigned to Roșia Montană as an ancient gold mining centre of the Roman Empire is well known amongst top academics and experts in the field. There are, however, substantial visible marks of uninterrupted habitation and mining operations for at least 700 years from the 13th century CE.

The combination of evidence for underground gold mining exploitation, surface ore-processing, and related, often integrated, surface habitation, cemeteries, sacred places and other remains, together constitute an ancient mining landscape that is rare for the Roman Empire, and extremely rare for Romania. The significance of this cultural landscape is elevated further by intensive and well-resourced archaeological investigation, tight radiocarbon dating and by the discoveries of numerous wooden artefacts and mining implements within the galleries, some of which have been dated by dendrochronology.

The cultural landscape holds much knowledge yet to be discovered, in good time and by sensitive method. Like Greeks, the Romans began their rise to power with very little gold in their natural resources and, once Hispania breathed signs of exhaustion, gold-rich Dacia was fair game. Archaeological research during the 2000s, by multi-national teams coordinated by the National History Museum of Romania, elucidates the opinion of Romanian historian and archaeologist Vasile Pârvan (1882–1927) that *Alburnus Maior* was, in ancient times: a *Californian town of international civilisation*, a frontier place that incorporated several temporary and permanent areas related to the presence of Dalmatian-Illyrian colonists, and others from regions of Hellenistic tradition south of the Danube that specialised in gold exploitation.

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B.	Roman (106–170 CE)	**p.** 70
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D.	18th and 19th centuries	**p.** 75
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2.b A Pre-Roman

102. Prehistoric surface mining works along a seam (© Horia Ciugudean)

The earliest elements of the site, however, date back to the Bronze Age, and a number of exceptional gold artefacts dating to this period have been found in the region.

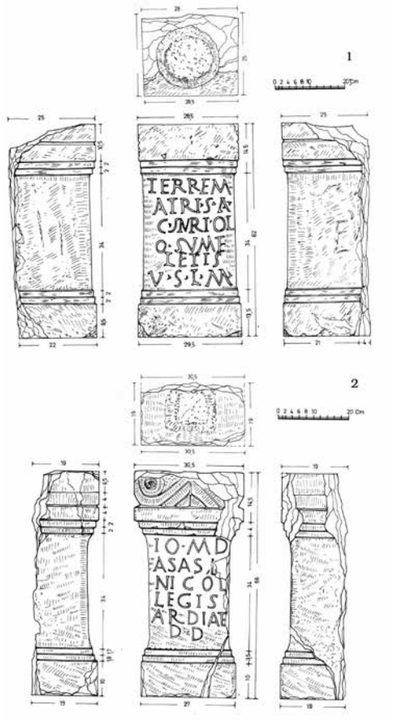
Small-scale placer gold recovery is believed to have started in this period. Placer refers to alluvial, from rivers, the word derived from Catalan and Spanish meaning a shoal or sand bar, and which entered international mining vocabulary in the 1848 Californian Gold Rush. It is also likely that shallow hard-rock surface mining (trenches along the surface exposures of gold veins) also took place. In 513 BCE Heredotus wrote of the Persian king Darius who started a war against the Agathyrsi - a branch of the Scythians living on the banks of the Maris (Mures River) in order to seize their gold. Heredotus remarks that: "they were highly delighted with large amounts of gold." The Mures River delimits the *Golden Quadrilateral* in the south.

In 218 – 202 BCE, the Romans gained access to the gold mining region of Spain during the second Punic War with Carthage, and recovered gold by alluvial and hard rock methods. In 50 BCE the Romans began the issue of a gold coin called the Aureus.

2.b B — Roman (106–170 CE)

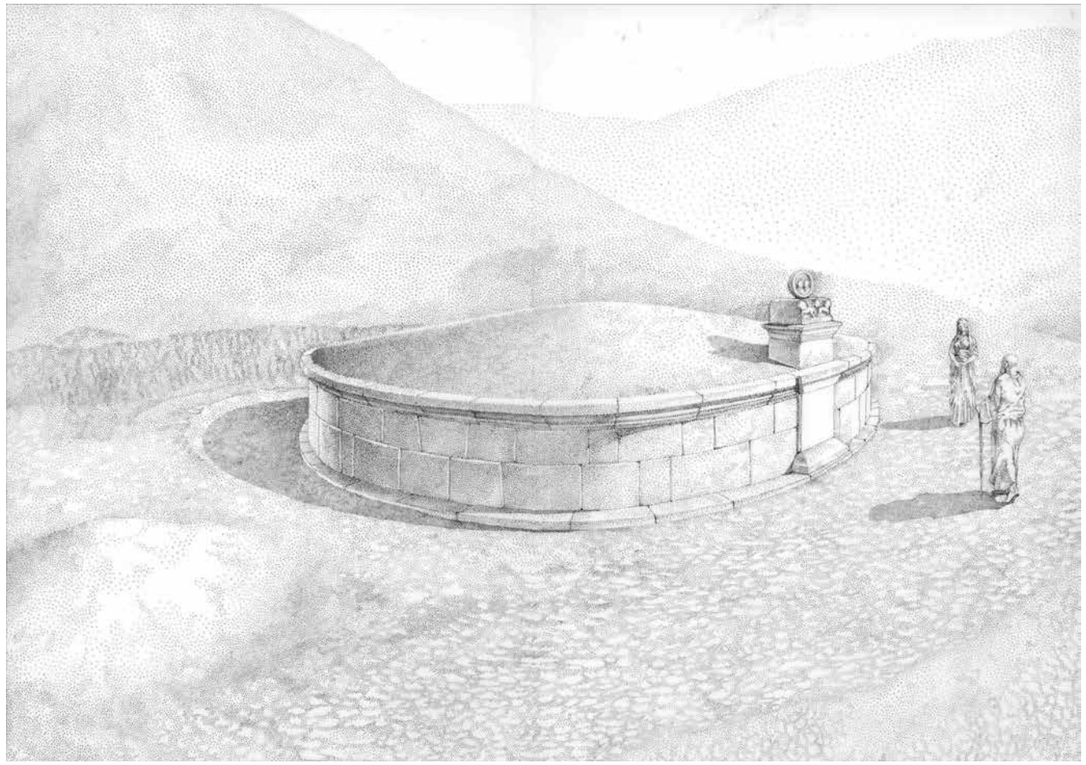
103. Wax Tablet XI (MNIR Archive)

104. Votive altar dedicated to Janus. Hop Găuri Area (MNIR Archive)



105. Roman funerary monuments, Drumuș Area (MNIR Archive)

106. Funerary Monument, Roșia Montană Mining Museum (© Lorin Niculae)



107. Reconstuction of the Circular Funerary Monument at Hop Găuri (© Virgil Apostol)

There was major gold mining and socio-economic activity in Roșia Montană during the Roman period (2nd century CE). The first underground mines in the property date immediately following the Roman conquest of Dacia in 106 CE. Dacians were known to the Romans as great metalworkers. In pre-Roman Dacia, where gold mines were very probably the property of Dacian kings, their direct passing into the property of the Roman state took place immediately after Dacia's conquest, as early as the reign of Emperor Trajan (as seemingly proved by the inscription laid by Hermias, *libertus* of the emperor, *procurator aurariarum*).

By August 106 CE the war was over and Dacia was set up as a Roman province.

Ancient sources report that the Romans found the equivalent of over 165 tonnes of gold in the Dacian thesaurus. Kriton (private doctor to Emperor Trajan) wrote about huge amounts of Dacian gold transported to Rome by their conquerors. Emperor Trajan celebrated his victory by announcing over 100 days of games and, with a boosted treasury from the spoils of Dacia, built his Forum and Column in Rome. The price of gold in the Empire sank during the following years: in 97 CE one pound of gold cost 3,962 dr.; by 127 CE it cost at most 3,800 dr.

After occupation the Romans improved the organisation of gold mining and processing methods, extracting an estimated 500 tonnes of gold during their 166-year rule. *Aurariae Dacicae*, together with the *metalla Illyrici* presented the richest source of metals in the entire Empire during 100 CE – 400 CE.

What is now Roșia Montană became the most important precious metals mining centre in the new Roman province. Its first attestation, on a wooden wax-coated writing tablet discovered in one of the mining galleries is dated February 6th, 131 CE. It also records the Roman name of the place: *Alburnus Maior*.

The Italic civilization of Ancient Rome was amongst the most remarkable in the world, its imperial period lasting a remarkable 1,500 years. Ultimately what creates and sustains empires is military force and trade. Rome – essentially devoid of precious metals on its own territory – needed gold and silver as coinage to pay its fighters; the term soldier (Medieval Latin *soldarius*, literally meaning "one having pay") ultimately derives from the Roman word *solidus* (Latin for "solid"),

the name of the Late Empire gold coin. And in terms of trade, Rome became the largest city in the world in ancient times – a gigantic emporium of luxury goods such as silk, pearls, ivory and spices - imported from India, China and elsewhere and paid for in gold. Gold was also something the citizens of Rome deeply desired: for jewellery, and to simply convey sheer wealth. Trajan's sights fell on Dacia at a time when he wanted to defend his Roman frontiers, but also a time when precious metal mining under Imperial control in Hispania had peaked in the first century CE. Whether it is coincidence, or not, it is certain that after the Dacian Conquest, gold mining began immediately and a procurator was brought to the Carpathian province, more likely directly from Rome rather than from Dalmatia - as presupposed on the basis of his wife's name Salonia (liberta from Salona).

The mining exploitation and organisation forms based on the Dalmatian and Illyrian model suggest that the Romans adapted the fiscal administration to specifically Roman organisational forms. In this a series of local (foreign) institutions were meant to provide economic and demographical prosperity to such provinces. The importance of the Dacian gold territory, especially of *Alburnus Maior*, in the framework of the customs system is reflected in the presupposition of the existence of a customs station.

Roșia Montană is un-paralleled as a Roman mining centre in terms of its documented epigraphy, an exceptional contribution to the authenticity of our understanding of the place. The wax-coated wooden writing tablets are first-rate sources of legal, socio-economic, demographic and linguistic information - not only regarding *Alburnus Maior*, but the entire Dacian province and, implicitly, the Roman Empire. The tablets reveal explicit details of mining organisation, sale and purchase contracts, receipts of loans with interest, and the sale of slaves. The evidence attests not only Illyrians, but also Greek and Latin migrants hired to work in the mines and organised in associations (e.g. *collegia auruariorum, societas danistaria*).

The writing tablets are also correlated with an unparalleled number of stone epigraphic monuments, votive and funerary. Most epigraphs seem to derive from the settlement on "Carpeni" and the cemetery at "Țarina". They were made of the Orlea gritstone. Those emerged before the recent archaeological campaigns were discovered by chance, without systematic and scientific research, which facilitated their migration to various collections; others vanished altogether. Many sculptural monuments of medallions and reliefs bear decorative and symbolic elements that evidence the intensive colonisation of mining technicians and specialists from Dalmatia. A number of the epigraphs have been preserved at the mining museum in Roșia Montană, whilst others are in the care of museum collections in Cluj-Napoca, Turda, Alba Iulia, Deva and Bucharest.

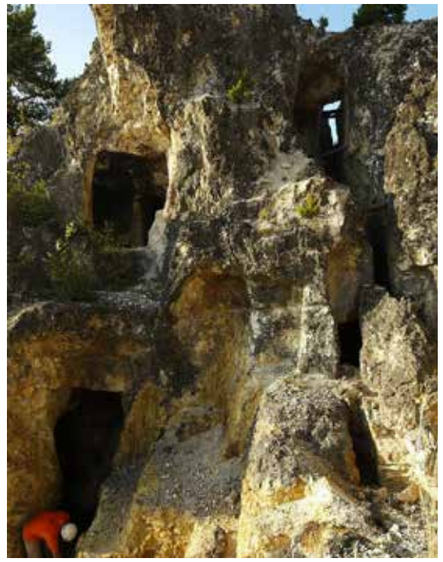
Roman mining techniques

Roman knowledge of geology was rudimentary, and they possessed limited technical mining skills. They were soldiers and farmers first, and never real miners. When they extended their dominion by conquest they made use of the submissive skill of the conquered peoples in the mining regions they overran. They had a tendency to retain, whenever possible, inherited "barbarian" socio-technical forms of mineral exploitation. In the case of Roșia Montană, hard rock mining expertise may have been limited, or absent, however, as it is known that skilled migrant Illyrian-Dalmatian miners were imported to exploit gold in such ways that suited the technical nature of the deposit.

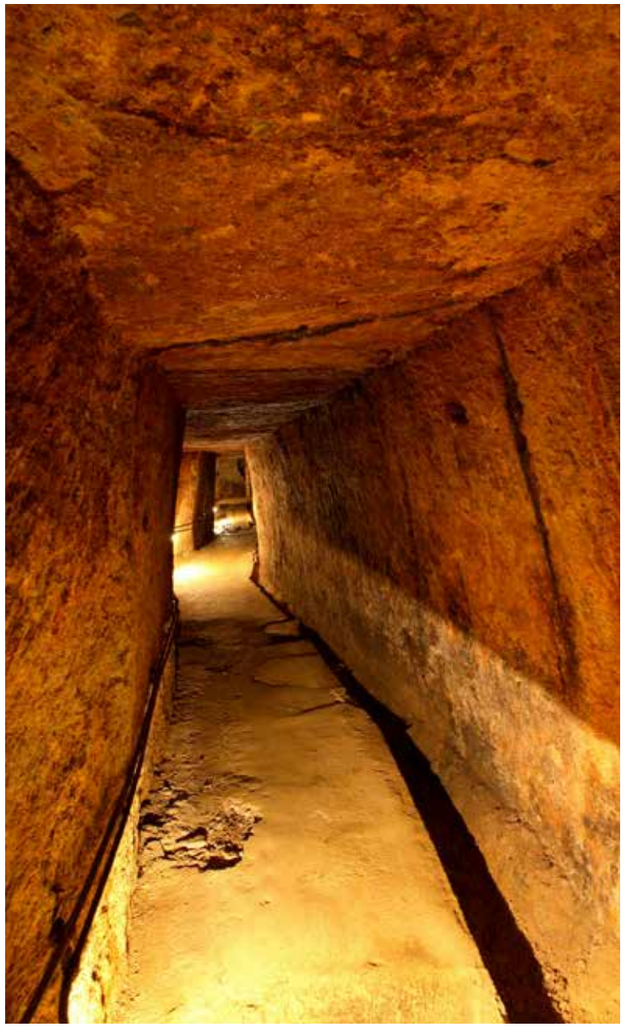
The pre-eminent underground Roman mining network that survives at Roșia Montană possesses outstanding technical attributes that provide exceptional testimony to the diffusion and further development of precious metals mining technology during the expansion of the Roman Empire in the 2nd and 3rd centuries CE. Archaeological investigation has revealed important aspects that contribute to the global history of mining. Such extensive perfectly carved trapezoidal-section galleries, helicoidal shafts and inclined communication galleries with stairways cut into the bedrock, and vertical extraction areas (stopes) superimposed above one another with the roof carved out in steps, are unknown elsewhere from such an early era and, further, are not described in known literature. Features such as multiple chambers for treadmill-powered water-dipper wheels (and the wooden remains of such equipment), whilst recorded but mostly destroyed elsewhere in the Roman world by subsequent modern mining, are preserved at Roșia Montană. These are of exceptional value due to their rarity, extent and state of conservation.

The Roman period did not involve revolutionary technology, it involved adequate, and appropriate, technology applied to the extraction and processing of ores and metals – sufficient to meet a high level of demand, at affordable prices. The Roman Imperial period brought intensification of that which already existed in Greek and Roman republican times, rather than innovation in methods of exploitation and is characterized by the extent of operations and the quantity of output. Under Augustus, existing mines expanded and new mines opened, using extensive shafts and underground galleries. Crude devices such as tarred baskets and buckets for bailing were used, hoisting them with a hemp rope. Drainage adits were used in combination with wooden treadmill-powered water-dipping wheels, in pairs and in series, worked by men who pushed the treads with their feet. Examples of these have been discovered at Roșia Montană. The Archimedean Screw, or cochlea, which was brought from the irrigation ditches of Egypt to the mines of Spain was also likely used.

Mining was done by hand using iron tools: picks, hammers and chisels. Timbering for support was rarely used in Roșia Montană because the inclined shafts and levels were small; but cross beams supported by uprights are evidenced in more dangerous ground (the same as in the case of Rio Tinto mines). Pillars of rock were sometimes left as supports for the roof in larger stopes, and filling with waste was another method for preventing collapse. Many entries were steeply inclined. Lighting was by rush lamps, and niches in the sidewalls of levels are commonly encountered. Many ancient lamps have been recovered.



108. Roman galleries in Cârnic Massif (© Ivan Rous)



109. Roman mining gallery in Orlea Massif (© Lorin Niculae)

110. Roman Gallery in Cârnic Massif, Roșia Montană
(© Ivan Rous)

111. Roman works with evidence for fire-setting
(© Radu Sălcudean)

Roman ore processing (gold and gold-silver ores), concentration and smelting

The Romans commonly used cupellation, an ancient technique where a gold-silver alloy (electrum) is treated under high temperatures under a controlled operation to separate the noble metals from any base metals that might be present in the ore. Precious metals do not oxidize or react chemically like the base metals that form slags or other compounds. The Romans also developed advanced methods of parting gold and silver (the removal of silver from gold, therefore increasing the purity of gold).

Ore containing precious metals was first roasted in order to oxidise any minor sulphides present; this also helped to better disintegrate harder rock. It was then crushed using hammers or mechanical stamps, then ground into a fine powder with pestle and mortar, or with rotary grinders like a grain mill. Crushing and grinding workshops have been discovered in Roșia Montană during several recent archaeological campaigns. The ore is then concentrated by water and gravity, either by panning, or on inclined wooden boards using some material to collect the heavy gold (the origin of the "Golden Fleece"). The concentrate is then charged in crucibles with specific additives, like lead metal or lead oxide, to facilitate the smelting process and to extract the two noble metals. Gold and silver pass into the lead metal and then, the lead-gold-silver mixture is poured into moulds and subjected to cupellation to separate the noble metals from the alloy by oxidising the lead. During underground archaeological excavations at Roșia Montană, a litharge (lead oxide) roll was discovered in the Roman underground galleries of Cârnic massif, being found within a secondary backfilling deposit of an inclined adit situated very close to the surface (few examples of archaeological evidence concerning the various steps of gold-silver metallurgy are known from prehistoric and ancient periods). The last step of the smelting process involved the separation or parting of gold and silver by the cementation process, using reagents such as salt, including sodium chloride, antimony sulphides and nitrates, a process that originated in Lydia in 6th century BCE.

After abandoning the rich gold and silver mines in Roman Dacia, the focus of Roman exploitation of ore was transferred to the provinces on the right bank of the Danube, to *Moesia Prima* and *Dacia Ripensis* and farther into the hinterland of the Balkan Peninsula, in Dacia Mediterranea and Dardania. In 271 CE most Roman troops abandon Dacia after fighting off barbarian Goths.

2.b C — Medieval and Early Modern (to 17th century)

It is assumed that there was little activity between the 3rd and 13th centuries in terms of gold exploitation in Roșia Montană, a period substantially with no written evidence. After the Romans left, society was organised into village communities and unions of village communities which, in time, united into larger political-administrative formations named knezdoms, dukedoms and lands, constituting the core of the future Principality of Transylvania.

Gold mining is next attested in the 1230s and continued to grow through the Medieval and into Modern Times. Although there is much archaeological work needed to investigate this period, there are a number of historical references that serve to highlight this activity. Following the Hungarian conquest of Romanian principalities and dukedoms, gold mining expanded as German miners (*hospites*) were colonised in the area. Under Béla IV (1206–1270), King of Hungary and Croatia (1235–1270), administrative structures had their own Romanian organisation, settlements usually conferred with the name of a respective river - as the majority of the Romanian population lived along river valleys. The date 1238 is significant as, at Cricău and Ighiu, German miners received the right to extract gold from "Chernech" - which is identified with the Cârnic massif in Roșia Montană. After Béla, in 1271, King Stephen donated the gold producing "land of Abrud and Zlatna" to the Alba Iulia diocese. In 1327–28, under King Carol Robert, the mining law was changed: previously, when a gold or silver mine was discovered on private property, the king took the land into his possession, giving the owner other estates in exchange, and taking 1/8 of gold and 1/10 of silver. The new rules meant owners could keep land with precious metals, keeping 1/3 themselves and giving the king 2/3 of the exploitation. Mining developed intensely and *Chernech* mine was again mentioned, this time in 1347.

At the beginning of 16th century, gold mines belonged to local patricians, and in 1579 some townspeople from Abrud are recorded as owning stamps and washing machines in Corna and Roșia valleys. In 1618, under Gabriel Bethlen's reign, an exemption from military service was introduced for miners, together with special aids for disabled miners, and freedom of circulation. In 1642, documents mention the so-called "fortress" – the Roman gold mine of Roșia Montană, together with hayfields and stamps. In 1676 there were 77 stamps recorded in the property. In 1690, the Habsburgs gained possession of Transylvania through the Hungarian crown.

2.b D — 18th and 19th centuries

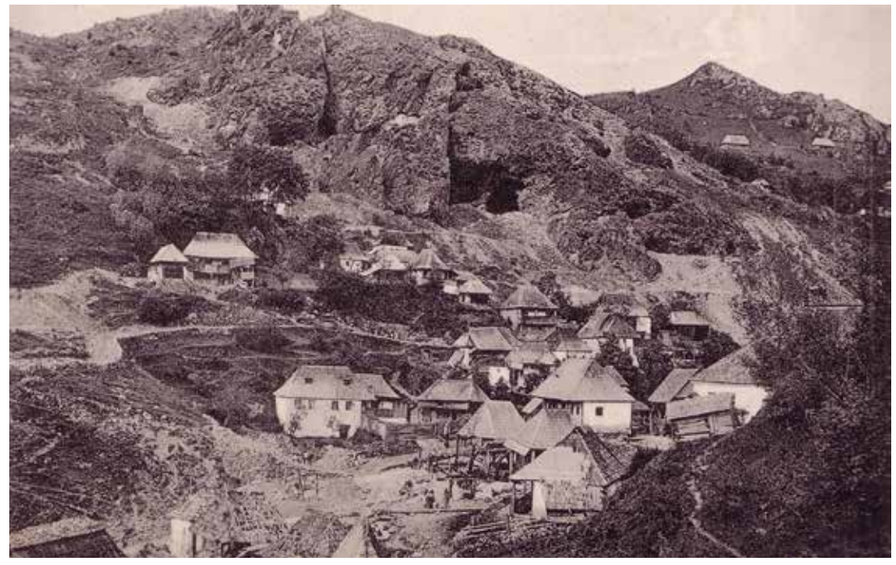
112. Private stamping mills. Photograph from the 1900s
(Csíky Lajos)

113. Brazi header pond. Photograph from the 1900s (Csíky Lajos)

114. Corna header pond. Photograph from the 1900s (Csíky Lajos)

115. The entrance to the Holly Cross Master Gallery of the gold mines. Photograph from the 1900's (Csíky Lajos)

116. The Square on a market day. In the background Ajtai Palace, demolished in the 1980s. Photograph from the 1900s (Csíky Lajos)



117. Văidoaia area, a typical small-scale mining neighborhood; each house or group of houses had a stamping mill. Photograph from the 1900s (Csíky Lajos)

In the 18th century Transylvania was under Habsburg rule and became part of the Habsburg Empire. During the reign of Empress Maria Theresa (1740–1780) and Joseph II (1780–1790), a revival of mining took place in Roșia Montană under a well-organised framework related to the creation and development of the Mining Treasury by the Habsburg Empire. During this fresh impetus the underground network was greatly extended using gunpowder blasting and assisted by the introduction of ore-transport in wagons on rails. Ore processing, by numerous waterwheel-powered stamping mills located in the main valleys (119 in 1757, 226 in 1772), was organised and sustained by the creation and possibly by the reuse of a series of large header ponds (HU: *tó*, RO: *tău* from DE: *Teich*). The creation of ponds, the setting up of new mines with waged labour, together with private capital participation, characterises this period. In 1746 the first private mine in Roșia Montană was Sfânta Treime (Vercheșul de Jos - Râzna). Stamps were donated to the churches (e.g. to Roșia, donated by Jurca Dumitru and Lupea Achim). From 1760-62 the commune

was called Verespatak and Maria Theresa, like her predecessors, administered Transylvania as a separate province (she proclaimed it a principality in 1765). In 1773, Empress Maria Theresa signed the statute of mining in Abrud, and made a donation to the Roșia Montană Catholic church. This included the cherished icon of Virgin Mary with a necklace of black pearls. Maria Theresa also modernised the large header pond of Tăul Mare, from which there are detailed records, including the use of an innovative water outlet control mechanism.

In 1781–82 the community lodged a complaint against compulsory labour hours "by hand and by cart" for the arrangement of such a "storage lake". In the uprising that ensued – the Revolt of Horea, Cloșca and Crișan, of 1784 – citizens of Roșia Montană set fire to Hungarian houses, the Catholic church and a few mine entries. Soon, mining specialists from Austria and upper Hungary were colonised in the area, a move that significantly changed the ethnic composition of the community and brought Western culture in the form of Central European houses, together with elements of Baroque and Neo-classical decorative art. Roșia Montană citizens took part in the Revolution of 1848–49 and George Gritta and priest Simion Balint became local heroes. After 1854 Roșia Montană acquired a dual name: Verespatak-Roșia, aligned with both Hungary and Romania. It separated from Abrud in 1857, and received an official statute in 1860. In 1867 Transylvania falls under the direct rule of Hungary. In the 1880 census there were 758 households with a population of 3,439.

The underground heritage of the 18th to 19th centuries is prolific and significant as one of the larger mining complexes of the Habsburg Empire. Further, in terms of a technological mining ensemble, it retains rare features such as wooden trackways or railways, the humid conditions in the mine having preserved, like their Roman wooden predecessors, substantial archaeology that rarely survives elsewhere. A characteristic of this new era was the use of gunpowder explosives in driving galleries much faster than ever before, allowing a more extensive penetration of the massifs. These workings have been archaeologically investigated in the Cârnic massif, only.

The hydro-technical system is impressive, and more extensive than presently visible; originally it counted over 100 header ponds and each will have had extensive leats (watercourses) of which some are visible in the landscape, and some not. Less visible, too, is evidence of the large number of small waterwheel-powered stamping mills that were operated by numerous families in the valleys. Traditional, pre-industrial mining was brought to an end by the communist nationalisation in 1948, all private stamping mills being abolished and destroyed. But their archaeology will still be there, and is worthy of detailed study.

Historic events that happened in, and around, Roșia Montană include the 1784 Revolt of Horea, Cloșca and Crișan, and the 1848 Revolution. They have left their traces on the ground, and in the intangible history of the place.

This first mining revival under the Habsburg reign of Empress Maria Theresa (1740–1780) and Joseph II (1780–1790) not only brought fresh socio-economic impetus to Roșia Montană, but also led to a succession of important discoveries that relate to the history of the place, and of the Roman Empire. This was a time when the celebrated Roman wax-coated wooden writing tablets began to be discovered, the largest cache of 11 items being recovered from the Cătălina Monulești Roman Gallery (tablets were discovered in 1786, 1788, 1790, 1820, 1824, 1854 and 1855). The unanimously accepted view among experts is that they were placed in relatively inaccessible mine galleries for safe keeping at a time of crisis: the Germanic Marcomanni incursions into Roman Dacia during 167–170 CE, part of the Marcomannic Wars that embraced the whole length of the Roman Empire's northeastern European frontier along the river Danube. The great scholar Theodor Mommsen, who visited Roșia Montană in 1851–53, studied these tablets. Arguably, as one of the most important attestations of Roman law, he published them in his *Corpus inscriptionum Latinarum*. The newest dated tablet coincides with a sudden suspension of the ancient archaeological record at Roșia Montană.

Some tablets were destroyed immediately after they had been found because of their critical state of preservation and the sudden contact with drying air when taken from their humid hiding places. Others disappeared. 24 are preserved, however, as remarkable epigraphic documents that yield unique, abundant and precise information regarding the economic aspects, the habitat system, the religious life and the juridical relations that governed this mining community. Unlike other similar discoveries in the Roman Empire, such as the batches of tablets from Vindolanda (Britannia) or Pompei (Italy), which also include elements of correspondence or literary exercises, the Transylvanian Triptychs are official documents, exclusively. They are namely legal documents-instrumenta, with a strictly particular and individual nature.

2.b E — 20th century

118. Procesing Plant. Stamping mills and electric power station at Gura Roșiei, 1927 (V. Zotinca)

119. Private mine in Roșia Montană, 1929 (Arthur Oskar Bach)

120. Cetate Massif, before and during the explosions in 1974 that destroyed the upper level of the historic mining works, as captured by geologist Aurel Sîntimbrean

After the Great Union of 1918, Roșia Montană was called Roșia de Munte.

During World War I, most mining activity ceased. In 1930 California stamps were introduced for more efficient crushing of gold ore. Share holding companies (cuxe) supervised mining activity. The 1940s precipitated a decline, and emigration of miners and their families to other Romanian mining fields, such as Valea Jiului, became commonplace.

After World War II, a communist-dominated government was installed under the sphere of Soviet influence. The 1948 nationalisation of the private exploitation of gold ore made the use of stamps forbidden and many private mines were closed. Traditional, pre-industrial mining was replaced by large-scale, underground industrial-scale mining and, subsequently, by opencast mining. The mining community suffered intimidation, brutal treatment and reprisals by repressive authorities in attempting to coerce family members to reveal the places where they "had hidden the gold for hard times". This was a dark time for the people of Roșia Montană. There was a rapid decline in prosperity, a general persecution of former mine owners, of stamps, stores and taverns, and a steady exodus from the place. In 1956 the population of Roșia Montană had fallen to 2,371, with 341 in Corna. Properties changed ownership at an unprecedented rate and underwent rapid physical degredation and decay. The spectacular Roman mining remains that survived in the Cetate Massif - the "Big Fortress" and the "Small Fortress" - were taken off the jurisdiction of the Monuments of Nature 2 February, 1970, to allow for large-scale opencast mining.

Communist era mining has left an indelible legacy in the landscape, but its less durable components have already substantially disappeared. Of course this period also forms an important part of the property's story, an era that represents the third and final phase of large-scale gold exploitation.

2.b F

21st century

121. General View - Tăul Mare, Cârnic Massif, Cetate Massif and the former mining exploitation (©Radu Sălcudean)

During the 1990s the state mine continued its open-cast exploitation of Mt Cetate (and in its final years even of Mt Cârnic), to be closed in 2006, on the eve of Romania's accession to the European Union, as a non-profitable, state subsidized enterprise. From the late 1990s a new proposal emerged, from a potential private investor, for resuming open-cast mining and expanding it to the entire site. From the early 2000s, this turned into a project that has taken several administrative steps in view of receiving approval, but never succeeded. At the same time, a strong public opinion emerged, in favour of preserving the cultural heritage of the site, which would have been endangered by the implementation of the mining project, considering at least the superposing of planned mining elements with specific, listed cultural heritage features.

The mining company has acquired properties within the footprint of the mining project, and became one of the major landowners in the area. It has also benefitted from a mining-only zoning plan. In 2016, the zoning plan of the municipality was annulled in court, closing the circle and bringing the community to the situation of no- mining plans.

During this interval, the active citizens of the area and supporting NGO's mounted a strong case for the preservation of the site, on ownership, environmental and cultural rights. Within the ensuing civic movement, the desire of promoting the site for the World Heritage emerged.

The same period saw the first systematic archaeological research campaign, developped within the framework of the proposed mining project. Database and GIS location systems were adopted since 2001, within the specially established Alburnus Maior National Research Programme, under the coordination of the National Museum of Romanian History, of Bucharest. This led to a great advance in knowledge on the site, which brought further detail and precision to the overall assessment, indicating a most valuable cultural and natural heritage place.